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EDITORIAL NOTICES

THE TREATMENT OF PERFORATED GASTRIC AND DUODENAL ULCERS.¹

By HENRY SEARBY, M.S. (Melbourne), F.R.C.S. (England),
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It is no longer debatable that perforated gastric and duodenal ulcers should be treated surgically as soon as possible after perforation has occurred. To delay operation until the patient has recovered from the shock of the perforation is unnecessary. Much difference of opinion exists as to what form the surgical treatment should take. During the past five years many contributions to the literature on this subject have been made by the French, German and American surgeons, the treatment recommended varying from simple closure of the perforation with or without gastro-jejunostomy to excision of the ulcer-bearing area again with or without gastro-jejunostomy. An extensive resection of the stomach and first part of the duodenum is even recommended as an immediate operation.

In this paper two series of cases are reviewed, (i) a series of 113 consecutive patients admitted to the Melbourne Hospital over a period of four years and (ii) 33 consecutive patients operated on by the author. Perforated ulcer is a surgical emergency. The mortality curve rises steeply with each hour's delay in operating, so that it is essential that operation be performed as soon as possible even under disadvantageous conditions. The procedure which is simplest, therefore, has much to recommend it, provided that it is justified by the results. To determine the best method of dealing with these perforations two points have been investigated, namely, the immediate mortality and the late end results. Many abdominal operations are performed in stages and if this procedure is safer and the end results satisfactory in perforated ulcer, more than one operation is justifiable. A patient with a perforation into the general peritoneal cavity is very ill and the surgeon's first concern should be to close the perforation. It is not advisable to add to the patient's risk the possibility of various complications that arise at times from further operative procedures in the upper part of the abdomen in the presence of infection. The mortality of efficient operative treatment of unperforated ulcers is very low. The ultimate results of the surgical treatment of unperforated ulcers are a matter for debate, but this is beyond the scope of this paper. I propose to review the results of gastro-jejunostomy and other forms of operative treatment done at the time of perforation. The analysis of the series of cases shows that the perforation should be closed as quickly as possible, that drainage should be used with discretion and that any further surgical procedure should be delayed.

¹ Read at a meeting of the Victorian Branch of the British Medical Association on November 13, 1929.

Age of Patients and Position of the Ulcer.

The average age of the hospital patients was forty-three years and of the author's series forty-one, the age distribution of the former being shown graphically in Figure I. In most instances it is easy to determine whether the ulcer is in the stomach or duodenum, but sometimes it is very difficult owing to the induration present and to the presence of lymph to be certain of the position and it is inadvisable for the surgeon to handle and displace structures in the attempt to determine this point. Of the 113 lesions in the hospital series the ulcer

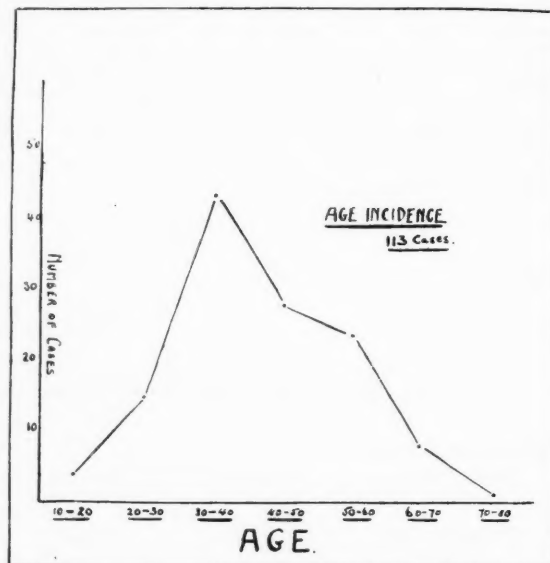


FIGURE I.

was duodenal in 50, gastric in 26, pyloric in 29 and in eight cases no record was made of the position. In the pyloric group mistakes are made, for at a second operation it is sometimes found that a so-called pyloric ulcer is duodenal. The percentages in the different positions in the two series are set out in Table II.

Diagnosis.

The diagnosis is usually made by the physical signs, although when the perforation has become sealed by the adhesion to it of some viscus, diagnosis may be difficult. Fortunately in these cases delay in treatment is not usually fatal. No reliance should be placed on the presence or absence of a history of ulcer. In nine of the 113 cases reviewed a diagnosis of appendicitis was made, but in eight of these the ulcer was dealt with when the appendix was found at operation to be normal in appearance. In five other cases operation was not performed because the diagnosis was wrong. Liver dulness was absent or diminished in 44% of the 113 cases. Vaughan and Brams⁽¹⁾ suggest screening the diaphragmatic area as an aid to diagnosis in doubtful cases, but this does not seem to be advisable as a routine.

TABLE I.
Showing Ages of Patients.

Series of 113 Patients.		Series of 33 Patients.	
Position of Ulcer.	Average Age.	Position of Ulcer.	Average Age.
Duodenal	44	Duodenal	38.4
Gastric	40	Gastric	40
Pyloric	33	Pyloric	48
Not stated	36	Not certain (1 case)	29

TABLE II.
Showing Distribution of the Ulcers.

Series of 113 Patients.		Series of 33 Patients.	
Duodenal	44%	Duodenal	45%
Gastric	23%	Gastric	21%
Pyloric	26%	Pyloric	30%
Not stated	7%	Not certain	4%

Past History.

There is no doubt that some patients with perforation have never had symptoms suggestive of gastric or duodenal ulceration. Often, however, a history of "indigestion" which was unobtainable before operation, is forthcoming during convalescence. Briefly the histories fall into two groups: (i) that described by Moynihan and others as typical of the condition, especially as to the periods of remission of symptoms and (ii) that with vague or absent symptoms until a few days prior to perforation when epigastric pain of varying severity has been experienced. Two patients in each of the series had suffered from perforation on a previous occasion. It is of interest to record that only six of the 113 patients had had the appendix removed.

Mortality.

The mortality in the two series of cases is set out in Table III which demonstrates very well that

TABLE III.
Showing Mortality in the Two Series.

Series of 113 Patients.	Series of 33 Patients.
113 patients. 37 died, a mortality of .. 33% 5 no operation. Operative mortality .. 30%	33 patients. 2 died. Operative mortality .. 6%
53 operated on within six hours. 5 died 9% 41 were under 50 years. None died 0% 12 were over 50 years. 5 died 42%	12 operated on within six hours. 8 were under 50 years. None died 0% 4 were over 50 years.
28 operated on between six and twelve hours. 9 died 32% 19 were under 50 years. 5 died 26% 9 were over 50 years. 4 died 44%	14 operated on between six and twelve hours. 1 died 7% 9 were under 50 years. None died 0% 5 were over 50 years. 1 died 20%
27 operated on between twelve and twenty-four hours. 15 died 55% 18 were under 50 years. 10 died 55% 9 were over 50 years. 5 died 55%	7 operated on between twelve and twenty-four hours. 1 died 14% 4 were under 50 years. None died 0% 3 were over 50 years. 1 died 33%
Mortality among patients under 50 years 19%	Mortality among patients under 50 years 0%
Mortality among patients over 50 years 47%	Mortality among patients over 50 years 16%

the mortality depends (i) on the time that elapses between perforation and operation and (ii) on the age.

The influence of age on mortality is shown graphically in Figure II.

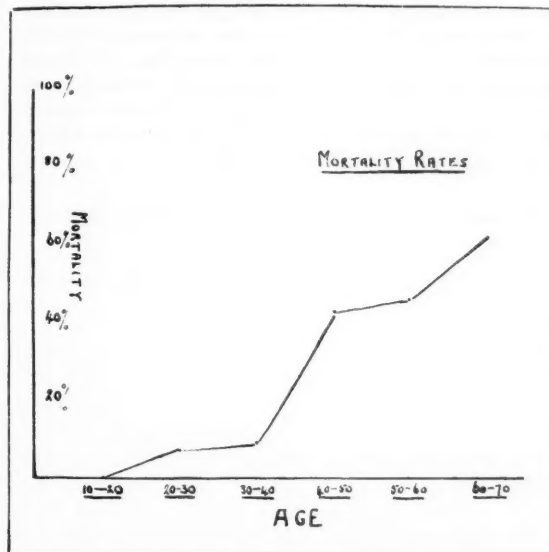


FIGURE II.

Treatment Adopted in Present Series.

Of the 113 patients admitted to hospital five were not operated on and all five died of general peritonitis. In two late cases when the perforation was sealed by adhesion to it of a viscus, drainage of a subphrenic space was the only treatment adopted. In the remaining 106 cases the methods of treatment were: Infolding of the ulcer without drainage, infolding of the ulcer with drainage of the pelvis, infolding of the ulcer with drainage of the upper part of the abdomen, infolding of the ulcer and gastro-jejunostomy without drainage, infolding of the ulcer and gastro-jejunostomy with drainage of the pelvis, infolding of the ulcer and gastro-jejunostomy with drainage of the upper part of the abdomen, excision of the ulcer, suture and drainage of the pelvis. The mortality of these procedures is set out in Table IV.

In this table the mortality among those patients on whom anastomosis was performed, is lower than

TABLE IV.
Showing Mortality of Operative Procedure in 113 Cases.

Operation.	Number of Cases.	Mortality.
Simple infolding	43	10 or 21%
Infolding, drainage of pelvis	23	11 or 48%
Infolding, drainage of upper part of abdomen	8	3 or 37%
Infolding and gastro-jejunostomy	13	2 or 15%
Infolding, gastro-jejunostomy, drainage of pelvis	9	1 or 11%
Infolding, gastro-jejunostomy, drainage of upper part of abdomen	2	1 or 50%
Excision, suture, drainage of pelvis	3	2 or 66%

in those in whom the ulcer was infolded; it must be remembered that the operation of gastro-jejunostomy was done only when the patients were young, the perforation recent and conditions generally favourable. The fact that the mortality among the 24 patients in whom gastro-jejunostomy was done, was 16%, indicates the seriousness of this procedure. In Table V the mortality of simple infolding of the ulcer is compared with that of infolding and gastro-jejunostomy in patients under fifty years of age in whom the perforation had been present for less than twelve hours.

TABLE V.

Showing Results among Patients under Fifty Years with Perforation of less than Twelve Hours' Duration.

Treatment.	Number of Cases.	Deaths.	Mortality.
Simple infolding	36	1	3%
Infolding and gastro-jejunostomy ..	24	4	16%

The Cause of Death.

The 37 deaths in the 113 cases were due to the following causes: Five patients, not operated on, died of general peritonitis, twenty-three others died of general peritonitis, four died from subphrenic abscess, one died from acute intestinal obstruction, one died from gangrene of the lung, one died from hæmorrhage at the site of gastro-jejunostomy. In two cases no *post mortem* report was available.

The cause of death in both cases in the author's series was general peritonitis.

One patient was a female, fifty-three years of age, whose ulcer had perforated thirty hours before operation.

The other was a male, fifty-six years of age, with a perforation of nine hours' duration, who developed a collection of pus in the pelvis some days after operation. This was drained, but he then developed a right posterior subphrenic abscess and later a left anterior subphrenic abscess and, though both these abscesses were drained, the patient died of toxæmia. At autopsy there were collections of pus between matted coils of the small intestine.

Thus in the series of 113 cases the mortality after closure of the perforation with or without drainage of the peritoneal cavity was 30%. It is very instructive to observe that in no case that came to autopsy had the infolded ulcer leaked. In one case a contact ulcer had perforated, but it was not possible to determine whether this had occurred before or after operation. In another fatal case a second perforation was diagnosed and sutured eleven days after the first operation. At autopsy the duodenum was gangrenous for a distance of five centimetres with multiple perforations. Except possibly in the last case, it can be assumed that death would have taken place even if gastro-jejunostomy had been done when the perforation was closed. The mortality among patients in whom gastro-jejunostomy was done, was 16%. This is much higher than the mortality from this operation in the absence of perforation and, as was shown in Table V, is very much higher than the mortality of simple infolding in patients of the

same age and with perforation of the same duration. As leakage from the sutured ulcer did not occur in any of the fatal cases, whether anastomosis was performed or not, it is fair to assume that no more would have died if the operation had consisted merely of closing the perforation. The only figures available as regards routine performance of gastro-jejunostomy, irrespective of the conditions found, are those of Bruett⁽²⁾ who reports a mortality of 29% in a series of 59 consecutive cases.

Drainage.

It is difficult, except in my own cases, to estimate the degree of peritonitis. Albrecht⁽³⁾ has shown that in the early stages of suppurative peritonitis any attempt at drainage is futile and may be injurious, as it disturbs the defence mechanisms by hindering the mobility of the omentum, by obstructing the continuous lymph stream that flows towards the diaphragm, and by reducing the intraabdominal pressure. Most surgeons agree with these views and with his principles of rendering the peritoneal cavity as nearly normal as possible by controlling the source of infection, removing pus, insuring hæmostasis and closing all defects in the peritoneum. Drainage should be necessary only when infective material must be left behind. In the late stages, when the organic defence is paralysed, the abdomen should be drained at the lowest point, for then movements have ceased and the intestines and omentum float in the pus-filled cavity. Much debate has taken place as to the infectivity of the gastric contents and therefore as to the necessity for drainage in perforation of gastric and duodenal ulcers. Loehr⁽⁴⁾ states that in 90% of perforations of the duodenum and in 82% of perforations of the stomach the gastric contents were sterile and that the number of organisms in any particular instance is controlled by the acidity of the gastric juice. Bartle and Harkins,⁽⁵⁾ however, found experimentally that only five out of twenty-six specimens of gastric juice were sterile and further that many organisms contained in the food are never reached by the acid, because they are lodged within particles of food. It appears, then, that in some patients at least, if the abdomen is not drained after a perforation, some infectious material will be left behind. On the other hand, the escape of gastric contents is sometimes very little and all of the escaped juice can be removed satisfactorily with a suction pump. In late perforations, when the abdomen contains frank pus, drainage is required. In some of the early perforations, even when all of the escaped contents cannot be removed, drainage is not necessary on account of the sterility of the fluid, but it is impossible to be certain in any particular instance that this state of affairs exists. My practice is, therefore, to drain the pelvis when the abdomen contains a large amount of fluid. A suction pump is always used, but while this keeps the operative field clear, it is impossible to empty satisfactorily either the pelvis or the renal pouch if there is a large amount of fluid. In such patients, no matter

how soon after perforation operation is done, a tube is put down into the pelvis and brought out through a stab wound above the pubis. Usually several pints of fluid escape within a few hours and the tube is removed in a day or two. This is not drainage because of peritonitis, but it seems to be the most effective method of emptying the peritoneal cavity, for when the patient is placed in Fowler's position the fluid runs down to the pelvis owing to the absence of adhesions in the early stages. No harm results from this method of drainage and it empties the peritoneal cavity of material which may be infective, thus satisfying one of the principles of treatment of the peritoneum.

Discussion on Treatment.

A review of the recent literature reveals a great diversity of opinion as to the immediate treatment. Bruett⁽²⁾ states that only 42% of cures result from what he describes as conservative treatment; by this he means infolding or infolding combined with gastro-jejunostomy. For this reason he advocates resection of the ulcer-bearing area of the stomach and duodenum in early cases. His mortality for fifty-five patients treated in this way was 14.5%, being 3.8% for those operated on within six hours and 68% for those operated on after twelve hours. Radoievitch⁽⁶⁾ also advocates extensive resection of the stomach and duodenum, but adds that the time which has elapsed since perforation, the condition of the patient and the physical character of the lesion must be the guiding factors. He admits that the small ulcer with little induration is usually cured by simple suture. Other authors believe that gastro-jejunostomy should be performed if the infolding of the ulcer is liable to obstruct the canal or if it is liable to cause contraction later. These reasons are not valid. Newton and Johnston⁽⁷⁾ have shown that in dogs it is possible to oversew the duodenum so that its ventral surface is invaginated for a distance of 0.75 centimetre and that the cranial and caudal borders can be sewn together without symptoms occurring at the time and that later the emptying time of the stomach is only slightly increased. They also investigated eleven patients with perforated ulcer that had been treated by infolding the ulcer and gastro-jejunostomy and ten cases in which the ulcer had been infolded but no further treatment had been adopted. The results were very much the same. No death in the series now under review was caused by obstruction and no patient that lived manifested during convalescence symptoms of this occurrence, so that it seems that the fear of obstructing the duodenum by infolding a perforated ulcer can be disregarded. The second reason given for performing gastro-jejunostomy, that is, that the infolding may cause contraction later, is also unsound because such a prediction cannot be made with any degree of certainty. The mechanism of healing is essentially the peritonealization of the area and the gradual undoing of the infolding so that the lumen is soon reestablished. Even with silk sutures the infolded area becomes smooth within a

month and with absorbable sutures in a much shorter time. The only adequate reason advanced for doing more than simple suture of the perforation is that one form of accepted treatment for ulcer is gastro-jejunostomy. Those who have seen many perforations at operation, are aware that there are two distinct types of ulcer found. In one there is a small opening with very little surrounding induration, there is usually very little escape of gastric contents and the opening is often partially closed by adhesion of the gall bladder or some other viscus. In the other type there is widespread induration, a larger opening, much more escape of gastric contents and very seldom any adhesion of other viscera. It is in the former type of ulcer that successful operation can be performed after a lapse of several days, that the diagnosis of perforation is often doubtful and that there is often delay in operating. In fact Loehr⁽⁴⁾ states that most of these would heal spontaneously. Duval⁽⁸⁾ reports that Moutier found two types of perforation. The amicrobic chronic ulcer perforates mechanically, the acute or chronic inflammatory ulcer perforates as the result of a subacute necrosis due to bacteria in its walls. He states that simple suture cures the former and advocates resection of the stomach for the latter. In the former the acidity of the gastric juice, especially if the stomach does not contain much food, overcomes the infectivity of the contents; in the latter it never does. Careful study of the histories in the two series reviewed in this paper revealed the fact that when the ulcer was of the so-called amicrobic variety, there was often a vague history of "indigestion" only and not one typical of gastric or duodenal ulceration as we know it. Certain of these patients vigorously denied all suggestions of previous indigestion. But usually for a week or two prior to perforation epigastric pain was experienced. Where a large ulcer with a lot of surrounding induration was found at operation, the history was usually typical of ulcer and the attack prior to perforation was described as worse than usual. This is interesting inasmuch as after infolding, these ulcers, when seen at a second operation some months later, are much smaller than at the time of perforation, but are still surrounded by an indurated area; the change in appearance may be coincident with the remission of symptoms that is so typical in unperforated ulcers.

In practically all published series of perforated ulcers only selected patients were treated by gastro-jejunostomy, the only figures available for routine performance of this procedure being those of Bruett, *vide supra*. In only three cases in the Melbourne Hospital series of 113 was the ulcer excised and in two of these death occurred. If it be conceded that the routine performance of anything more than simple suture carries a heavier mortality than the mere infolding of the perforation with or without drainage, the late results of the former type of treatment should show a much higher percentage of cures to be justified. This is not the case, but even if it were, it seems reasonable to deal first with the

perforation and later with the ulcer, if symptoms are still present. Of the 76 patients in the hospital series who survived, more than half have been traced and the results of the various types of treatment are set out in Table VI.

TABLE VI.
Showing Late Results of Hospital Patients.

Type of Ulcer.	Treatment.	Result.
Duodenal ulcer.	Simple suture.	30% well for from four to six years. 10% symptoms controlled with use of alkalis.
	Suture and gastro-jejunostomy.	50% well after four to six years.
Gastric ulcer.	Simple suture.	33% fairly well after four to six years.
	Suture and gastro-jejunostomy.	37% well after four to six years.

The results, when in addition to closing the perforation gastro-jejunostomy was performed, are only slightly better than when simple suture of the perforation was done. Such additional treatment must add to the patient's risk and at the best only about 50% of good results can be expected. Gastro-jejunostomy was done at the time of the perforation in 24 cases; four patients died, the anastomosis was unpicked within a month in four others and only half of the remaining patients were well some years later. In one of the fatal cases hæmorrhage had occurred into the cavity of the stomach and between the coats, in another there was a line of necrosis where clamps had been placed on the stomach. In one patient whose anastomosis was unpicked, there was a series of abscesses round the sutures (chromicized gut) used for the anastomosis and in another there was a large ulcer reaching to the peritoneal coat of the stomach and extending on to the jejunum.

The method of treatment adopted in the thirty-three patients operated on by the author was to close the perforation with as little handling of the viscera as possible, by two superimposed invaginating sutures, to aspirate as much fluid as possible with a suction pump and to drain the pelvis through a suprapubic stab wound. An accurate account of the condition seen at operation was recorded and the patient told before he left hospital that the ulcer was probably not cured and that it was necessary to report at intervals. Alkaline powder consisting of equal parts of bismuth carbonate, calcium carbonate and magnesium carbonate, was supplied and the patient warned not to smoke before meals and not to take alcohol except with meals and then well diluted. In patients of the public hospital class it is impossible to insure a rigid medical treatment being carried out, because most of them have to work during the day and will not persevere with it. The results in 23 of the 33 operations done more than a year ago are as follows: There were 13 patients with duodenal ulcer. All were treated at the time of perforation by simple infolding and drainage in most cases. Three are quite well after

from one to three years. One, well with reservations as to diet, is working. Two are fairly well, symptoms can be controlled easily with alkalis and they are working. Seven had return of all symptoms in periods varying from three months to one year. At a second operation these were treated by infolding the ulcer deeply and performing a posterior gastro-jejunostomy. In five of these there was considerable contraction of the duodenum at the site of the ulcer. Six (including the five which had contraction of the duodenum) are now quite well for periods varying from one to three years. One is no better and still has pain and vomiting.

There were ten patients with gastric ulcer. All were treated at the time of perforation by simple infolding and drainage of the pelvis. Two are quite well since (two years and three years). Two keep comfortable with the alkaline powder and as their ages are sixty-one and sixty-three respectively, they wish to avoid further operation. Two have return of all symptoms, but refuse operation. Four had a return of all symptoms and were submitted to a second operation. Various methods of treatment were used, including excision of the ulcer and gastro-jejunostomy and partial excision of the stomach. All four are still well for periods varying from one to three years, one of the patients pursuing his occupation of professional footballer.

Thus three of the 13 duodenal ulcers and two of the 10 gastric ulcers that perforated are apparently cured by closure of the perforation. To have done an operation such as gastro-jejunostomy in these patients at the time of perforation must have been wrong. In addition, 10 patients are now well after a second operation, so that 15 out of 23 are to be classed as good results, that is, 65%. Of the rest five are fairly well, that is, 22%, and three are as bad as before the perforation, but two of these had gastric ulcers and now refuse a second operation.

The operation of infolding a perforated ulcer can be performed in less than thirty minutes. The rectus muscle is reflected outwards. This step takes a few minutes longer than splitting the muscle, but it leaves the patient with a stronger abdominal wall and if a second operation is necessary, the muscle can be reflected again. The stomach is held by an assistant, no retraction of the wound is necessary and two number 0 chromicized gut sutures are inserted; the first is placed beyond the indurated area in the form of the letter Z so that it holds its place firmly in the wall of the stomach or duodenum and infolds the perforation easily when drawn tight. The second suture is then placed beyond the first. During this time a suction pump is moved about and as much fluid as possible is removed. If a lot of fluid is present, if it is turbid or offensive or if the perforation is of more than six hours' duration, a stab wound is made above the pubis and a tube put down to the bottom of the pelvis and brought out through the stab wound. The abdomen is closed in layers, the anæsthetic being stopped as soon as the posterior sheath is closed so that the time between

when the patient leaves the operating table and when he can be placed in Fowler's position is shortened to about one hour. The fluid collects in the pelvis and rapidly escapes through the tube. Half a litre of saline solution is given by the rectum as soon as the patient is back in bed and this is repeated in two hours, after which it is administered every four hours for the first twenty-four hours. The patient is allowed sips of water as soon as he is conscious, milk and water in equal parts after twelve hours and Benger's food in addition after thirty-six hours. No alkalis are given for the first fortnight.

Conclusions.

1. Perforated gastric and duodenal ulcers have a high mortality.
2. It is not advisable to do more than close the perforation at one operation.
3. Adequate oversewing of the perforation will prevent leakage and will not result in undue constriction of the stomach or duodenum.
4. Probably about 25% of patients are cured by simple oversewing of the perforation. In such cases gastro-jejunostomy or other surgical treatment directed towards the cure of the ulcer is unnecessary.
5. The mortality of the operation of gastro-jejunostomy in the presence of a perforation in the series of cases under review was 16%, whereas the mortality of simple suture in cases similar as regards age and duration of the perforation was 3%.
6. The results of gastro-jejunostomy done at the time of the perforation were very little better in the cases reviewed than those obtained by simple suture.
7. If symptoms recur after closure of the perforation, the ulcer can be treated medically or surgically, as is deemed advisable. It is considered that a larger percentage of permanent cures will be obtained in this way.
8. Drainage should be used in many cases to remove infected material from the peritoneal cavity.

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EXPERIMENTAL CONSIDERATIONS IN PERTHES'S DISEASE.¹

By R. V. GRAHAM, M.D., Ch.M. (Sydney), F.C.S.A.,
Sydney.

OBSERVATIONS of the condition of the *ligamentum teres* and of the head of the femur in such conditions as congenital dislocation of the hip in which trauma undoubtedly plays a prominent part in the observed changes, led to the following series of experiments. These were undertaken with the object of determining what part was played in the causation of the pathological changes observed in Perthes's disease by changes in the blood supply conveyed to the growing femoral epiphysis through the *ligamentum teres*. Its blood supply might conceivably be affected in various ways.

It might be altered by gross trauma such as would result from the stretching and subsequent atrophy of the *ligamentum teres* in patients with congenital dislocation of the hip.

There might be the less obvious but equally profound changes of the nature of partial devitalization and subsequent asphyxia of tissue resulting from spasm in these vessels, such a spasm conceivably being due to circulating toxins or to disordered metabolism resulting from endocrine disturbances.

The experiments were performed upon fourteen goats ranging in age from five weeks to seven months at the time of the commencement of the experiments. The first experiment commenced on June 23, 1928.

The right *ligamentum teres* was divided in each instance and the left *ligamentum teres* was left intact in order to provide a control when the goat was subsequently killed. The goats were examined with X rays at intervals following operation and then at varying periods of time the goats were killed and the head and neck of each femur were removed for purposes of comparison. At the same time it was possible to ascertain that the *ligamentum teres* had been totally divided on the

¹ Read at a meeting of the Section of Orthopaedics, Australasian Medical Congress (British Medical Association), Third Session, Sydney, 1929, and published with the consent of the Executive Committee of Congress.

right side. In some instances the blood supply to this portion of the femur was cut off by ligating the structures in the cotyloid notch and thus avoiding any incision in the hip joint. Great care was taken at operation to avoid any direct injury to the cartilage and the head of the femur; with this object in view a special instrument was devised somewhat like a pedicle needle which was curved in two planes conforming to the spherical shape of the head of the femur and having a cutting edge near the point, so that it was possible to insert this instrument through an arthrotomy incision in the capsule and divide the *ligamentum teres* without damage to the articular cartilage.

During the period between operation and their death these goats lived in the fresh air on the ordinary diet as supplied to the herd of goats used for experimental purposes at the Medical School and no effort was made to restrict the activity of the limb operated upon.

Owing to the fact that several died during the recent winter and that it has been difficult to secure goats of the correct age for these experiments and to various unforeseen delays it has not been possible to complete the full series of experiments prior to the date of this meeting, so that this paper will be limited to those experiments referred to above, in which the *ligamentum teres* has been divided on the right side without any other interference with the health or metabolism of the animal.

Experiments involving artificial infections with attenuated cultures of organisms, interfering with calcium metabolism in the direction of decreased supply of calcium and also of increased excretion of calcium must be left for description in a subsequent paper as the results are at present incomplete.

The capital epiphysis of the femur obtains its blood supply from three sources: (i) branches of the obturator artery which reach it through the *ligamentum teres*, (ii) from the *circulus vasculosus articuli* which is a ring of blood vessels surrounding the articular cartilage and lies in the transition area between synovial membrane and articular cartilage from which end arteries pass up beneath the articular cartilage and furnish it with its blood, (iii) vessels passing through the epiphyseal plate and derived from the blood supply of the diaphysis. This is the only instance in the body where it is possible to cut off the blood supply to a given portion and still leave the surrounding anastomosis intact. The primary object of the experiments in this group was to observe changes ensuing upon such a procedure.

After removal of the head of the femur it was noticed in every instance that the articular cartilage maintained its integrity throughout, but in several instances it was noticed that there was a definite facet on the upper surface of the articular cartilage of the head of the femur in the exact position where the weight of the hind quarter would be transmitted through the acetabulum to the head of the femur in a quadruped. The divided end of the *ligamentum teres* on the operated side had a comparatively

smooth surface and in each instance was entirely free of any adhesion or attachment to the other surfaces of the joint. There was no undue amount of synovial fluid in the joint on the operated side and the rent in the capsule of the hip joint occasioned at the operation had healed perfectly. There was no macroscopic change in the articular cartilage of the acetabulum. In one instance, that of a young goat, the entire epiphyseal cap had separated from the upper end of the shaft of the femur. Some of the specimens removed were submitted to microscopical examination after decalcification and very definite changes were observed in the young goats, that is those below the age of four months at the time of operation and also when the time elapsing between the operation and final removal of the head of the femur had been short. In other experiments, when older goats were used or when the time elapsing between the two operations was greater, the difference between the operated side and the non-operated side was almost negligible. The general microscopical changes observed were those associated with an aseptic necrosis and absorption of bony trabeculae. In each instance there was no evidence of change in the articular cartilage beyond slight atrophy in areas corresponding to the facet on the upper surface of the head. Blood vessels were recognized in the *ligamentum teres* showing the usual changes associated with an obliteration of their lumen. In several instances there was evidence of flattening of the whole epiphyseal cap as compared with that on the normal side and the epiphyseal plate also appeared of diminished thickness and in many instances lost its wavy outline in sagittal section. Such a change is extremely suggestive of the early changes likely to occur in Perthes's disease. Anatomic vessels gave evidence of increased activity at the periphery of the epiphyseal plate, but there was no evidence of any granulation tissue spreading from the edge of the articular cartilage. Some specimens, instead of being sectioned, were injected with carmine jelly and subsequently cleared and studied under the binocular microscope. One such specimen is available for your inspection today. It is easy to detect specimens from the operated side by the opalescent appearance of the articular cartilage and by the obviously smaller amount of carmine jelly contained in the whole of the head of the femur as compared with that on the unoperated side; this specimen clearly demonstrates the integrity of the articular cartilage on the operated side. Skiagrams taken at various intervals after the initial operation yielded very inconclusive results. A critical examination of them failed to disclose definite changes even in those specimens of which microscopical examination subsequently revealed definite absorption of bony trabeculae in the head of the femur.

In a few instances it was considered that there was a slight increase in the joint space between the head of the femur and the acetabulum on the operated side, but no evidence of the usual X ray signs of Perthes's disease was obtained. The clinical

examination of these animals at various intervals after operation led to the impression that the functional activity of their hip joints was practically unimpaired following division of the *ligamentum teres*. In each instance animals exhibited a slight limp for the first few days, but this rapidly disappeared and there was no obvious atrophy of the muscles controlling the hip joint, there was no rigidity and at no time was there any evidence of other disability; in fact after the first few days it was difficult to distinguish the operated side or the operated goat in the herd while watching them walking about.

These pieces of evidence are interesting in view of Sundt's conclusions about Perthes's disease in the hip joint, namely that there was no real difference in the degree of deformity when patients with this disease were immobilized for two years or for one year or were allowed complete freedom of movement throughout the course of their disease. Several other observers have noticed the tendency to natural arrest in Perthes's disease.

As a result of the observations in this paper it is possible to draw the following conclusions.

1. Division of the *ligamentum teres* in goats is followed by changes which vary according to the age at which the division takes place and to the time elapsing between division of the ligament and removal of the head of the femur for observation. Photographs exhibited demonstrate the fact that the changes following this division are almost negligible in goats above the age of six months.

2. In younger goats necrosis and absorption of bony trabeculae ensue in an area underlying the attachment of the *ligamentum teres* to the head of the femur, which is in shape roughly that of an inverted cone.

3. In most instances there is a definite flattening of the epiphyseal plate in sagittal section. This apparently results from a disproportion between the rate of growth of the cartilage cells on the two sides of the epiphyseal plate; at present specimens suggest that this leads to deformation of the cap similar to that in the early stages of Perthes's disease.

4. These changes tend to undergo natural repair when the goat is allowed unrestricted liberty on an ordinary diet.

5. An obvious conclusion also is that the *ligamentum teres* diminishes in importance as a source of blood supply to the femur as the age of the animal increases.

6. X ray evidence of changes following this operation was inconclusive even in the presence of definite early macroscopical changes.

7. In this series it has been impossible to produce typical Perthes's disease by simple division of the *ligamentum teres*.

Acknowledgements.

I have to express my thanks to Miss Garde for producing the microphotographs illustrating this article, to the Bosch Research Fund, to Professor Stump and Professor Welsh for providing technical assistance which was of the greatest help in these experiments.

NOTES ON STERILITY IN WOMEN.¹

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WHEN I, following on my work under Dr. Sidney Forsdike, decided to continue the study of sterility in the female, I was frequently told that it was not how to cure sterility, but how to produce it that was wanted these modern days. In spite of this discouragement, I have encountered many women who have very earnestly desired a child and in a few instances I think I have been instrumental in paving the way for the arrival of the stork and its longed-for burden.

In a previous paper that I read before the Obstetrical and Gynaecological Section of the New South Wales Branch of the British Medical Association,⁽¹⁾ I had worked out that the number of women who remained sterile after ten years of married life, was 7.9%, a fairly low number when compared with the sterility rates published for other countries.

In the figures that I shall quote, I wish to point out that I am claiming a successful result whenever the woman has become pregnant after she had submitted herself to my investigation and care, but I am including none who has come to me during the last four months.

My routine investigation is as follows: (i) I make a general and pelvic examination of the wife, (ii) I make a general examination of the husband and examination of his semen. If the above examinations are not productive of any cause, I then proceed to the further examination of the woman by (iii) gas insufflation of the Fallopian tubes (Rubin's test), (iv) injection of "Lipiodol" into the uterus and tubes and a stereoscopic skiagram of the pelvis.

With regard to insufflation, I have discarded the use of air and have reverted to carbon dioxide. This gas I obtain from a large size (J.) "Sparklet" bulb contained in a metal holder with a control tap. The whole apparatus (Figure 1) is very compact and can be carried in the pocket if need be. The advantage of the use of carbon dioxide over air is the rapidity of its absorption from the peritoneal cavity, so much so that the patient can rise immediately from the examination couch.

Neither in my own patients nor in any whom I saw when clinical assistant to Dr. Forsdike, have I seen any ill effects arise from the use of this simple test, but before using it I am careful to exclude the presence of any active inflammatory condition in the genital tract.

If insufflation reveals that the tubes are freely patent, I leave any further investigation for several months, directing treatment, if necessary, along general lines. Following insufflation alone, six patients (10%) have become pregnant. Two of

¹ Read at a meeting of the Obstetrical and Gynaecological Section of the New South Wales Branch of the British Medical Association on March 15, 1929.

these have come to term, one aborted at three months and three have not yet reached term. Of these four had primary sterility and two secondary sterility. The four patients with primary sterility were aged from thirty-five to twenty-seven years and had been married for periods between twelve and six years. The two patients with secondary sterility had both been married a second time, one seven and the other twelve years ago. By their first husbands both had had children, the first woman had two, the younger being nine and a half years of age, and the second one child of eighteen years. All but one of these patients became pregnant within three months, one even missing the period following the examination.

To what can we attribute a successful result following insufflation alone? I think that in some instances slight adhesions are present at the fimbriated ends of the tubes and these are broken down by the pressure. The adhesions are the result of a mild peritoneal inflammation associated with pneumonia, measles, scarlet fever or appendicitis or else a mild puerperal infection. In other cases there may be an isthmiospasm (of which more later) which the pressure, acting like a mercury-filled dilator in cardiospasm, overcomes at least temporarily. Clinically I have noticed that if at first the gas will not flow and the pressure is raised or maintained it may eventually pass. The highest pressure I have used is two hundred millimetres of mercury, but I usually start at one hundred.

If no pregnancy has supervened within a reasonable time of insufflation or if insufflation has disclosed that the tubes are closed or not freely open, I then proceed to inject the uterus and tubes with "Lipiodol" and have a stereoscopic skiagram of the pelvis taken. By this means I have obtained some very valuable information of the condition of the tubes, but on only two patients have I felt justified in doing a salpingostomy and I feel certain that this operation has a very limited field in the treatment of sterility.¹

A utero-salpingograph is useful in gynaecology outside the diagnosis of the condition of the tubes in sterility. By its means one can diagnose tumours encroaching on the uterine cavity, such as the small fibroids shown in Figure II, differentiate between a hydrosalpinx and an ovarian cyst (see Figure III), determine whether a cyst is intraperitoneal or intraligamentous *et cetera*. A general surgeon remarked to me when I was showing some of these skiagrams at the annual meeting of the College of Surgeons of Australasia: "The gynaecologist should now have no need for a 'look-see' operation."

Figure IV depicts a pair of badly damaged Fallopian tubes. On the right side filling defects are seen; the tube contained an ectopic gestation. In the left tube there was irregularity of the lumen and a peculiar circular twist caused by extratubal adhesions. The specimen (see Figure V) I removed at operation. Unfortunately an enthusiastic resident

medical officer opened the specimen and so destroyed it.

The use of these "Lipiodol" injections has disclosed in a number of patients the presence of a condition of localized spasm in the neighbourhood of the tubal isthmus which suggests the presence of a sphincter. No true sphincter can be demonstrated anatomically, but neither can one be demonstrated at the cardiac end of the oesophagus, the site of cardiospasm. Apparently this spasm is present in two conditions: (i) hypoplastic types of the uterus and Fallopian tubes and (ii) in salpingitis.

The following seven figures illustrate this isthmiospasm, the first three being examples associated with hypoplasia and the other four with salpingitis. Gas failed to pass at 180 millimetres of mercury through the tubes in the pelvis illustrated by Figure VI. The woman complained of pain when I had injected only three cubic centimetres of "Lipiodol," so I had a skiagram taken which, on being developed, revealed merely an outline of the uterine cavity. I refilled the syringe and injected at a higher pressure seven cubic centimetres of "Lipiodol." This time the tubes filled and you will notice the spasm at the tubo-uterine junction, the small retroverted and acutely anteflexed uterus and the long, thin, tortuous tubes. This patient was twenty-eight years old and three years previously had had a curettage and a ventro-suspension performed. Figure VII reveals a similar condition and owing to the high pressure used, the "Lipiodol" has shot through the tubes into the peritoneal cavity when the contraction was overcome. In Figure VIII isthmiospasm associated with a bicornuate subseptate uterus is recognized.

The patient whose pelvis is illustrated in Figures IX and X was a woman aged twenty-seven years, who had been married for eight years. Shortly after her marriage an abortion occurred and as a result she evidently had some salpingitis. The left tube bears definite evidence of this; its lumen is irregular, it is acutely bent by adhesions and its extremity is closed and bulbous. The right tube is seen to be less damaged and is patent. Ten months before these skiagrams were taken, insufflation led to entry of the gas through the right tube, but there was no passage of gas through the left. This woman became pregnant within five weeks of the skiagrams being taken, shall I say as a result of the spasm being relieved by belladonna or by the action of the "Lipiodol" on the damaged tubes, for "Lipiodol" can be useful therapeutically in chronic salpingitis.

Figure XI depicts an almost completely fibrosed right tube, the result of acute salpingitis. The left tube had been removed three years previously, the right being left in the hope that it would recover and enable the patient, a young married woman, to conceive. In addition to the isthmiospasm, small pockets separate from the narrow lumen can be noticed. The presence of these pockets in tubes that have been inflamed, are a probable cause of ectopic gestation.

¹ Since this paper was written to the end of 1929 I have performed salpingostomy eight times and one patient, operated on in April, became pregnant (intrauterine) in October. The pregnancy is proceeding normally.

In Figure XII a normal left tube but for the spasm at the isthmus can be seen. The right tube was closed to gas at 200 millimetres of mercury and the "Lipiodol" has failed to penetrate beyond the right horn of the uterus. In this patient there was a history of Neisserian infection.

Figure XIII depicts the tubes damaged as a result of a puerperal infection. The left tube has a large bulbous end and adhesions. It is completely blocked. There are adhesions of the right tube and a dilated ampulla, but it is open.

In Figure XIV the tubes are seen to be damaged as a result of puerperal infection, but not to the same extent as in Figure XIII. The right tube is partly open. This is an ideal case for salpingostomy.

In Figure XV both tubes can be seen blocked at the ampullary ends, the right being slightly dilated. They were both resistant to a gas pressure of 200 millimetres of mercury. The patient was twenty years of age, had been married for two years, there was no history of Neisserian infection, but she had had both scarlet fever and pneumonia.

As a cause of sterility isthmiospasm must be considered along with its associated conditions. Dr. I. C. Rubin, the originator of tubal insufflation, in a recent paper⁽²⁾ states:

Observations of many cases in which the question of tubal patency was determined, indicate that the incidence of tubo-uterine spasm is not very frequent. It occurred about nine times out of 450 cases. . . . The tubo-uterine junction is apparently guarded by a sphincter apparatus analogous to the pyloric sphincter, although as in the latter no definite muscle bundles have so far been demonstrated.

In Dr. Rubin's series of 450 patients the presence of isthmiospasm was noted in nine or 2%. I have been more fortunate in my smaller series in that it has occurred six times or 10% and in this series every patient has not been examined by radiography.

I should like to make a few comments on treatment. In the so-called hypoplastic conditions, especially in patients under twenty-five years of age, I have had a certain amount of success with organo-therapy, especially in relieving the associated dysmenorrhœa. The greatest difficulty is to get the patients young. Every girl who has menstrual abnormalities, should have medical advice, for it is in the early years that treatment can do most good. But how often do we hear the story that the mother has told her daughter that she will be all right when she gets married. After marriage the same symptoms continue and although desired, children do not arrive. Medical opinion is not sought for several years, the woman then being too old to gain much benefit from treatment and the prolonged dysmenorrhœa has left its psychic scar.

In acute anteversion I am certain that operations of the Dudley type and curettage are not only unnecessary, but frequently determine sterility. I would like to stress that a retroversion is a normal condition in over 20% of women. Many of these women on marriage readily fall pregnant and if they do not, correcting the retroversion is not likely

to be of much help. There is usually some other reason for the sterility.

Major operations are of very little use in the cure of sterility and minor and less obvious symptoms and signs are often of much greater importance than the more obvious.

In conclusion I shall give the detailed figures of my present series. The total number of patients considered is sixty.

TABLE I.

Condition of Male Partner.	Number.	Conception Occurred.
Sterile	5 = 8.3%	0
Refused examination and presumed to be sterile	6 = 10.0%	0
Gross sterility	11 = 18.3%	0

In the remaining forty-nine instances the male partner's semen contained active normal sperms. The details of the findings in the forty-nine females are shown in the following table.

TABLE II.

Cause of Sterility.	Number.	Conception Occurred.
No gross cause found	17 = 34.5%	6 = 35.0%
Genital hypoplasia	14 = 28.5%	3 = 21.3%
Salpingitis	18 = 37.0%	1 = 5.5%
Totals	49 = 100.0%	10 = 20.5%
Total including the eleven women whose male partner is or is presumed to be sterile	60	10 = 16.6%

I beg to thank Dr. Bede Harrison and Dr. Anderson Stuart for their assistance with the skiagrams.

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SOME NOTES ON CERTAIN PITFALLS IN ORAL RADIOGRAPHY.

By GEO. F. S. DANSEY, D.D.S.,
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KNOWING how interested the medical profession has become in dental radiography in view of the recognized importance of dental infections in systemic diseases, a few remarks from my experience in that branch of radiography may be of some interest.

Very often a patient's wellbeing and indeed the reputation of the physician is dependent on any focus of infection being discovered. Hence I might state that a carefully and properly exposed series

of films of the right density and penetration and each tooth taken from at least two angles is the very foundation of treatment. Only upon such a base can reliable interpretation be built up.

In this country the usual procedure is to obtain a series of ten films for a whole mouth examination. In so small a series most of the teeth can be shown from only one angle. It is quite usual to find distortion, particularly in the upper cuspid and molar region, due to bending the films, a further hindrance to correct interpretation. An area of lessened density indicating infection is not necessarily situated directly at the apex, giving a drum-stick appearance like a tetanus spore. Very often it is situated below the apex and to one side of the tooth root. Therefore, if the film is obtained from one angle only, an area can be completely hidden by the root and the tooth given a normal appearance. I have a number of examples of this deception which, were it not my custom to show every root from at least two angles, might have resulted in a misleading report.

Having this experience in mind I would like to suggest that a series of fourteen films for a full mouth examination be insisted upon, none of the teeth on which must be distorted and each apex be clearly shown from two angles. The teeth should be approximately the normal size. That there be sufficient penetration is of great importance; otherwise the superficial bone will mask the deeper rarefied area. A trained eye will not be misled, but I have more than once seen reports and films showing that this condition is a common source of error for the inexperienced. American medical practitioners are now asking in addition to the fourteen intraoral films a right and left extraoral views and it is surprising the unsuspected lesions at times revealed, such as a malposed third molar tooth lying just beneath the sigmoid notch. The time is coming in this city when both an extraoral and intraoral examination of the upper and lower jaws will be asked for when possible oral trouble is being sought.

Another suggestion is always to have a routine examination of the whole mouth when there is suspicion of apical focal infection. The decision to have only that part of the mouth which contains gold crowns and pivots, examined by X rays will result in many septic areas remaining undiscovered. In my experience pivoted teeth on the average are more likely to be a source of infection than are gold crowns. Porcelain cement fillings, now so universal, can be completely overlooked, the teeth appearing normal to the eye. Probably apical sepsis is caused more often by the pulp dying when adjacent to porcelain cement than under any other filling material. Large metal fillings also merit suspicion. Teeth normal in appearance and without any change in colour or any signs of caries, can from obscure causes have dead pulps and apical areas. Spaces, the result of previous extractions, must on no account be missed. While the overlying gum may

appear perfect, the skiagram will often disclose a hidden septic stump or a small area of necrotic bone. An aseptic stump will eventually be thrown off by Nature, but not so a septic one. In a proper routine examination it is quite common to find this condition. A socket from which the tooth has been completely removed, and the surrounding gum appearing normal, may yet be shown not to have filled in with bone, on account of a residual infection retarding regeneration. From the above it must not be assumed *ipso facto* that even edentulous people do not harbour a dental septic focus.

As the result of carrying out a routine examination, whether teeth are present or not, I have numerous examples of the above pitfalls and cannot emphasize too strongly the importance of this thorough examination. In patients who do not respond satisfactorily after treatment, I would suggest the necessity of repeating the X ray examination in five or six months to eliminate some of the conditions mentioned above, such as latent infection in sockets caused by necrosis or cystic formations.

A source of sepsis very easily missed by one not conversant with dental procedure is that known as perforation of a root, generally caused when the canal is being enlarged for a post to anchor a crown or a filling. Sometimes several views are necessary to determine this condition.

In view of the significance of exostosis and condensing osteitis according to Dr. Weston Price, these conditions also should not be overlooked in an X ray report.

My third suggestion is that the medical practitioner should not rely on the radiographer's report alone. Each item in the report should be compared with the corresponding film evidence. By so doing he will become familiar with the radiographic appearance of dental sepsis or other disorders. He will be able to check the radiographer and many surprises may come his way, for I have seen films and reports stating that there was no evidence of apical sepsis when owing to faulty technique the apices of some teeth were missed altogether.

In dental X ray work there is no accepting "good enough" as "right." It is exacting work, demanding time, thought and experience. Unreliable films and inexperienced interpretations may be the means of causing a medical practitioner to be turned away from the true source of an infection. Whilst a knowledge of dental surgery is essential for a number of radiographic interpretations, nevertheless a very large number remains which a medical man can quite easily recognize after some practice and so act as a check upon careless work.

A few remarks on the use of the X rays for conditions other than apical sepsis may be of interest. Neuralgia of dental origin is very commonly due to decay at the cervical border of fillings. This condition is easily detected by clear skiagrams when it is difficult to discover it with a dental explorer. Partial devitalization of a pulp may cause severe pains, when the tooth is subjected

ILLUSTRATIONS TO THE ARTICLE BY R. V. GRAHAM.

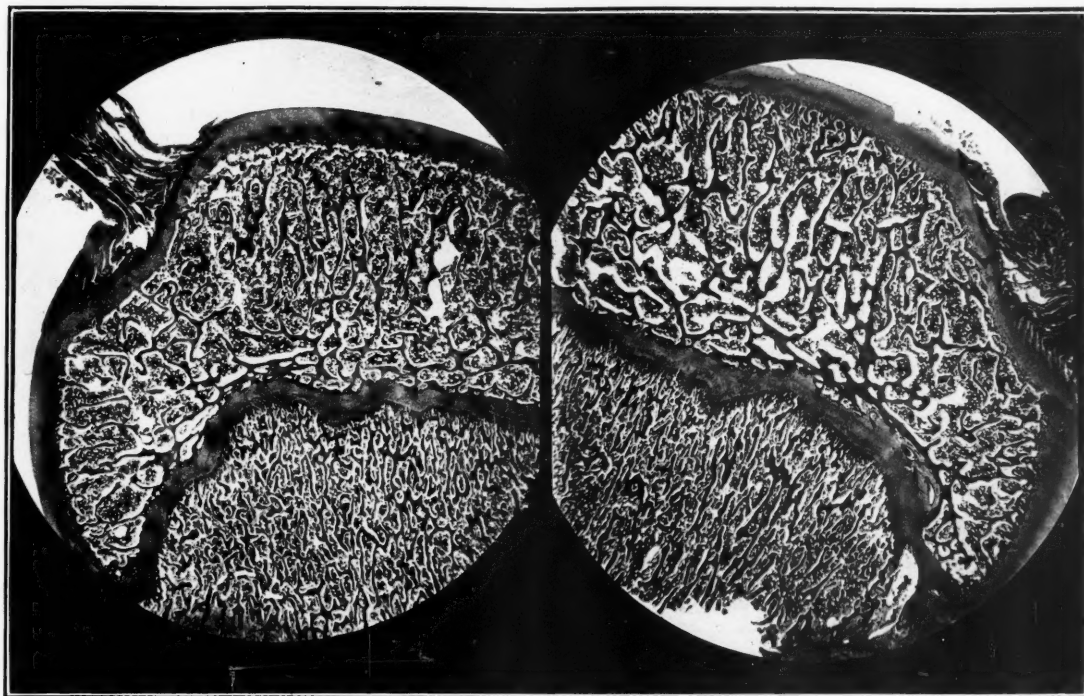


FIGURE I.

Two weeks after operation. Note epiphyseal plate on right side relatively flat.

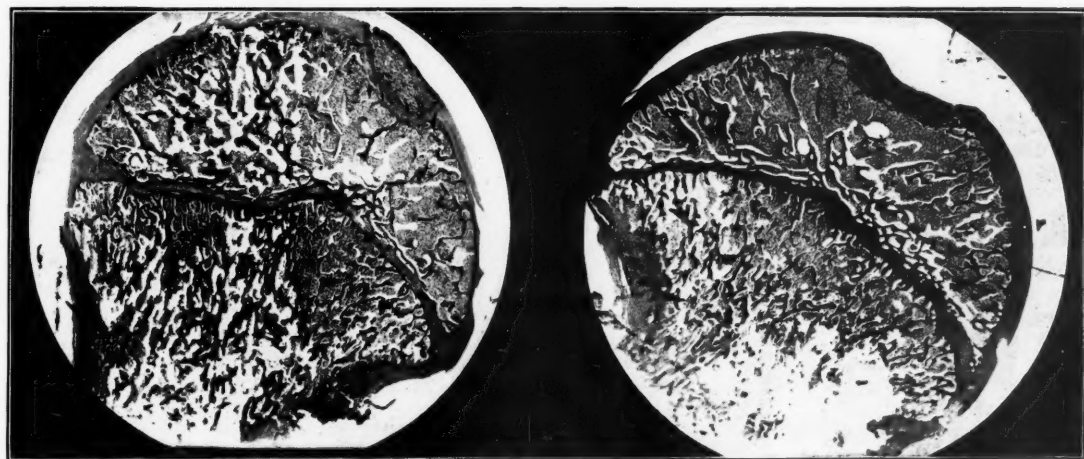


FIGURE II.

Five weeks after operation. Note absorption of trabeculae beneath attachment of divided *ligamentum teres*; relatively flat epiphyseal plate and tendency of epiphyseal cap to "mushroom"; also relative decrease in vertical height of epiphysis on operated side.



ILLUSTRATIONS TO THE ARTICLE BY R. V. GRAHAM.

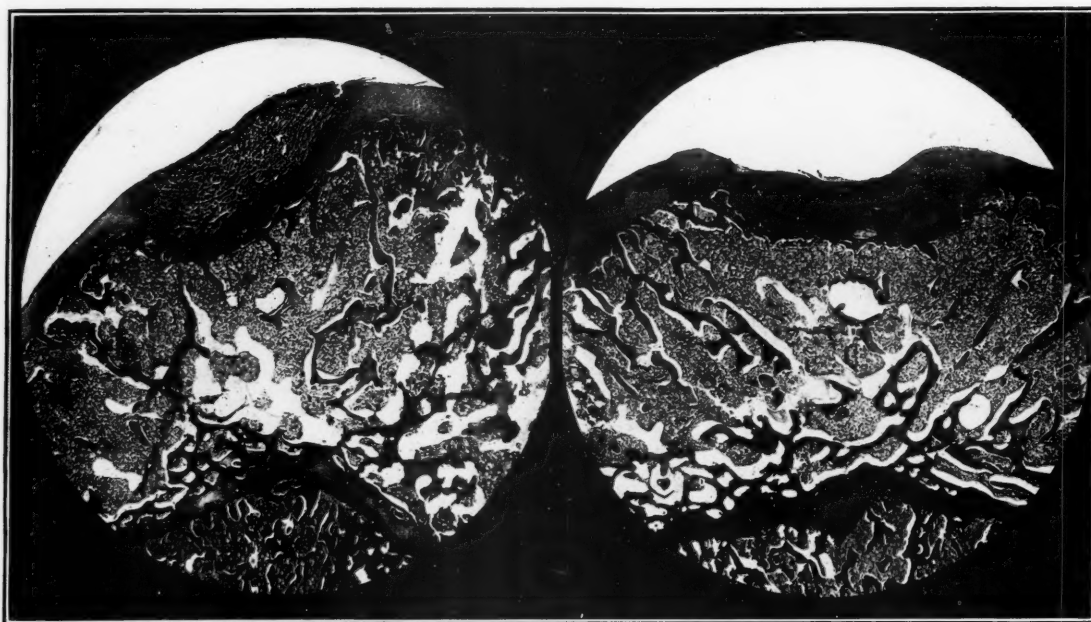


FIGURE III.

Five weeks after operation. Note flattening of epiphyseal plate and cap and absorption of bone on right side. In each figure the right side is that on which the *ligamentum teres* was divided at original operation. The goats were killed at varying periods and the heads of both femora removed, the left providing a control on the right.

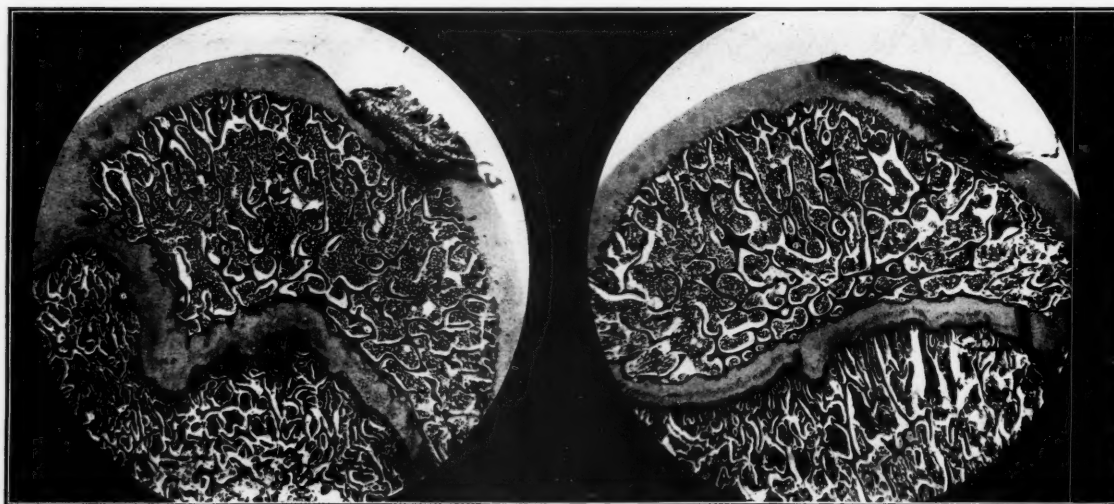


FIGURE IV.

Two and one-half months after operation. Flattened epiphyseal plate well shown on operated side, no absorption of bone.

ILLUSTRATIONS TO THE ARTICLE BY R. V. GRAHAM.



FIGURE V.

Five months after operation. Epiphyseal plate tending to return to normal outline on right—complete repair in epiphyseal cap.



FIGURE VI.

Five and a half months after operation. Epiphyseal plate on right side still flattened but tending to resume curved outline coincidently with repair in epiphyseal cap, which is, however, still shortened in the vertical diameter.



ILLUSTRATIONS TO THE ARTICLE BY DR. CECIL COGLAN.

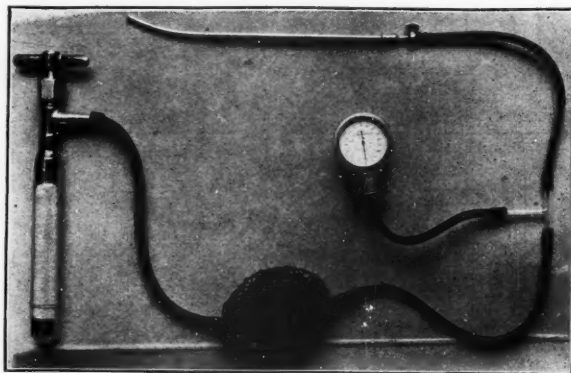


FIGURE I.



FIGURE II.



FIGURE III.



FIGURE IV.



FIGURE V.

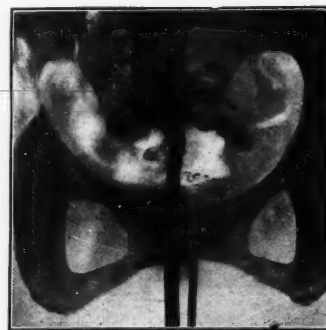


FIGURE VI.

ILLUSTRATIONS TO THE ARTICLE BY DR. CECIL COGLAN.



FIGURE VII.



FIGURE VIII.



Left side.] FIGURE IX.



FIGURE X. [Left side.



FIGURE XI.

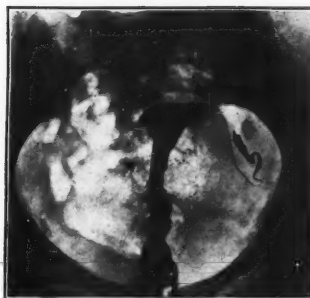


FIGURE XII.



ILLUSTRATIONS TO THE ARTICLE BY DR. CECIL COGHLAN.



FIGURE XIII.



FIGURE XIV.



FIGURE XV.

ILLUSTRATIONS TO THE ARTICLE BY DR. GEO. F. S. DANSEY.



FIGURE I.
This skiagram and that of Figure II demonstrate that a septic area may be missed if a tooth be examined from one angle only. There are practically no indications of area of sepsis.



FIGURE II.
Skiagram of the same tooth disclosing a well defined area at the apical region.



FIGURE III.
The necessity to examine an edentulous jaw is demonstrated by the finding of the cystic area remaining five years after the last tooth was extracted.



FIGURE IV.
A skiagram revealing how a septic apical area can become encapsulated by a rapid bone regeneration at the apical region of an extracted tooth's socket.



FIGURE V.
A skiagram illustrating the risk taken if any teeth are passed over. The lower left central incisor was in no way suspected. There was no change in the tooth's colour or the appearance of the surrounding gum and no decay; yet this tooth was a virulent source of sepsis.

ILLUSTRATIONS TO THE ARTICLE BY DR. F. W. CARTER.



FIGURE I. April 23, 1927.



FIGURE II. July 14, 1927.



FIGURE III. October 14, 1927.

ILLUSTRATIONS TO THE ARTICLE BY DR. F. W. CARTER.



FIGURE IV. January 5, 1928.



FIGURE V. July 2, 1928.



FIGURE VI. October 3, 1928.

to a sharp change of temperature, especially heat; in these cases a thickening at the apical portion of the pericemental line can generally be noticed. Pulp stones were considered likely sources of obscure pains until skiagraphic examination revealed their presence in so many teeth that everybody ought to be more or less affected; they may at times be a source of pain, but only in rare circumstances. In edentulous patients with much absorption of the alveolus, where the mental foramen appears as a slight prominence, it may be irritated by the pressure of an artificial plate, thus setting up a neuralgic condition. Impacted teeth and erupting third molars and exostosed roots are sometimes the cause of obscure pain. Sometimes the question arises as to the relation of these impacted teeth to those adjoining; this can be determined by taking two views, one with the tube at right angles to the teeth and another different by an angle of about 45°. If it is noticed that the unerupted tooth follows the movement of the tube, it is nearer to the film and therefore lingual to the adjacent teeth; if the other teeth have moved with the tube, they are in that position.

Before concluding it may not be amiss to mention that at times a radiographer is asked to report upon the condition of the remaining teeth of a patient who is suffering from gastric disturbance, such as indigestion *et cetera*. The teeth may be normal, yet dentally quite inefficient when closed together, because the molars or bicuspid do not articulate with the opposing jaws, hence there will be faulty mastication which in itself is a potential cause of indigestion. This state of the mouth is seldom noticed by the medical profession. In other cases patients may say that they have artificial plates, but it is necessary to ascertain whether they wear them both while masticating.

AN INVESTIGATION INTO THE ALLEGED THERAPEUTIC PROPERTIES OF VINCA ROSEA IN THE TREATMENT OF DIABETES.

By A. B. CORKILL, M.B., B.S. (Melbourne),

AND

A. DOUTCH.

(From the Baker Medical Research Institute, Alfred Hospital, Melbourne.)

INTRODUCTION.

SINCE the introduction of "Insulin" therapy various attempts have been made to combat its most serious disadvantage, namely, the necessity for subcutaneous administration. Various pancreatic preparations have been made for oral administration, but these have not been of definite value.

Recently Frank, of Breslau, noted that poisoning with guanidine was accompanied by a hypoglycæmia. This fact led him to think that it might be worth while to search among guanidine derivatives for a substitute for "Insulin." Ultimately a

synthetic compound with ten carbon atoms was elaborated. The compound was decamethylenediguandine and was termed "Synthalin." Extensive trials of "Synthalin" have not led authorities to believe that it can replace "Insulin."

Superficially "Synthalin" would appear to resemble "Insulin," but it differs in some important respects. The action of "Insulin," when it is administered subcutaneously, begins almost immediately, whereas "Synthalin" begins to manifest its action only after some hours.

Dale, as a result of his investigations, came to the conclusion that physiologically the mechanism of "Synthalin" action was quite different from that of "Insulin." In Lawrence's opinion "Synthalin" possesses more disadvantages than advantages. The disadvantages are its frequent toxic action when given in efficacious doses, the uncertainty of its action, the fact that it cannot partially or wholly replace "Insulin" in severe diabetes and that it cannot be taken continuously, but must be intermitted, involving a readjustment of diet and "Insulin."

PLANT SUBSTANCES ALLEGED TO HAVE A THERAPEUTIC EFFECT IN DIABETES.

From time to time various plants have been held to have a beneficial effect in diabetes. Eucalyptus tea was claimed in some countries to be of value. In America blueberry leaf has been the subject of an extensive investigation by Allen.⁽¹⁾

Recently in Australia considerable claims have been made on behalf of *vinca rosea* and prickly pear leaves. The following is a résumé from an article in the *Queensland Agricultural Journal*:

Vinca rosea, a perennial herbaceous plant, one to two feet high. A native of West Indies and tropical America, but now naturalized in most of the warmer parts of the world. Common name is "Periwinkle." In Queensland the plant usually occurs along sandy beaches, particularly from Maryborough northwards.

According to the article, the directions for treating diabetes are as follows:

Each day boil 27 leaves in three and a half cups of water for fifteen minutes, then strain. Take one cupful after each meal; one hour afterwards as much soda bicarbonate as can be got on a sixpence in half a glass of warm water. Diet consists of all green vegetables and meat three times a day. Avoid ordinary bread.

In South Africa the discoverer of Vinca has put up a proprietary medicine which he terms "Covina," for which it is claimed that eight of every ten cases of sugar diabetes will find the use of insulin and strict dieting unnecessary.

In addition to published accounts of the beneficial action of vinca in diabetes, we had received personal communications from practitioners who stated that they were obtaining good results with this form of therapy.

In view of these statements and influenced by the results obtained by Allen with blueberry leaves, we determined to investigate the therapeutic properties of vinca.

Whilst this investigation was proceeding there appeared in THE MEDICAL JOURNAL OF AUSTRALIA, November 17, 1928, an article entitled "Vinca Treat-

ment of Diabetes," by L. J. Jarvis Nye and Margaret Fitzgerald. The authors' conclusion, based on the observation of four cases of diabetes, was that vinca produced no appreciable effect on the sugar content of the blood or urine in diabetes. Although our work was incomplete we criticized this conclusion⁽²⁾ mainly on the ground that the tests to which vinca was subjected, were not planned so that any mild beneficial action of the plant could be demonstrated. We have to admit after further work that our conclusions are the same as those of these authors; nevertheless, the criticism that we offered is still valid. At the time of writing we thought that an extract of vinca prepared in this laboratory had an inhibiting effect on the experimental hyperglycæmia produced by the injection of adrenalin, but we have since found that this effect is not constant.

Lee and Drew in THE MEDICAL JOURNAL OF AUSTRALIA, May 25, 1929, have published their results obtained by administering vinca leaf extract to normal rabbits *per os*. They conclude that, even when it is given in fairly large quantities, no fall in blood sugar level is obtained.

Allen in his work on blueberry leaves prepared an extract which he termed "Myrtillin." Of sixty of his patients whose food tolerance or the "Insulin" requirement had certainly been stable for at least a year, thirty-six manifested beneficial results.

It was therefore decided to prepare an extract of vinca leaves and, if satisfactory experimental results comparable to those of Allen were obtained, to try its effect in diabetes.

Allen claimed the following actions for "Myrtillin": (i) It would inhibit alimentary glycæmia and hyperglycæmia; (ii) it would diminish experimental adrenalin hyperglycæmia; (iii) it would prolong life in diabetic dogs; (iv) it would control hyperglycæmia and glycosuria in diabetic patients.

Slightly modifying Allen's method, we prepared an extract of vinca leaves as follows: The air dried leaves were extracted in acid alcohol for fourteen hours at 60° C., 570 cubic centimetres of 60% alcohol volume in volume *plus* one cubic centimetre of concentrated hydrochloric acid (specific gravity 1.124 being used for each thirty grammes (ounce) of leaves. The fluid was strained free of leaves by means of muslin and the leaves were pressed in a meat press, the liquid thus obtained being added to the remainder of the extract. The strength of the alcohol was now raised to 70% by the addition of 95% alcohol and the resulting precipitate was removed by suction filtration through paper pulp. A solution of 20% aqueous ammonium sulphate was now added in sufficient quantity to make the final concentration of this salt in the fluid 1%. A precipitate formed which was collected, dried and pulverized. This constituted the extract.

A comparison of the properties of "Myrtillin" as given by Allen and those of the extract prepared at the Baker Institute is set out below:

"Myrtillin."

Greyish or brownish amorphous substance.
Solution in water or dilute alcohol forms a slightly turbid colloid solution.
Acid favours solution.
Alkali forms a gelatinous precipitate.

Insoluble in absolute alcohol, ether and acetone.

Vinca Extract.

Brownish to green amorphous substance.
Forms almost colourless opalescent solution in water or dilute alcohol.
Acid favours solution.
Alkali causes a precipitate, but not of a gelatinous nature.

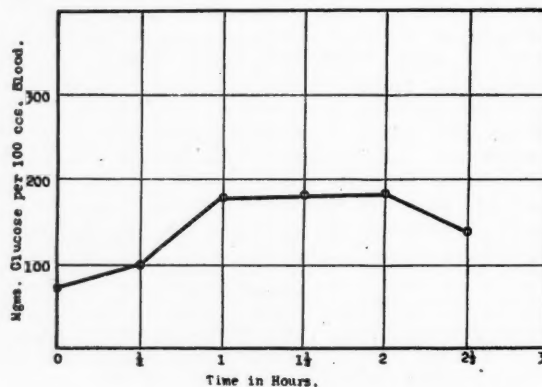
Insoluble in absolute alcohol, ether and acetone.

THE RESULTS OF VINCA THERAPY.

Experimental Results Obtained with Vinca Extract.

The Effect of Vinca Administration on the Experimental Adrenalin Hyperglycæmia of Rabbits.

Six male English rabbits, each weighing approximately two kilograms, were used. As a preliminary test each rabbit was bled from the marginal ear vein at intervals of half an hour for two hours and the blood sugar was estimated by McLean's method. From these observations we were able to assure ourselves that no significant hyperglycæmia resulted from successive bleeding or by handling the animals. It was found that 0.2 cubic centimetre of one in 1,000 adrenalin (Parke, Davis and Company) was a suitable dose for producing hyperglycæmia. The curve of adrenalin hyperglycæmia was plotted out for each rabbit (see Graph I). After a week's



GRAPH I.
Typical chart showing effect of subcutaneous injection of 0.2 cubic centimetre of one in 1000 adrenalin solution in a rabbit. The administration of vinca extract failed to modify this curve.

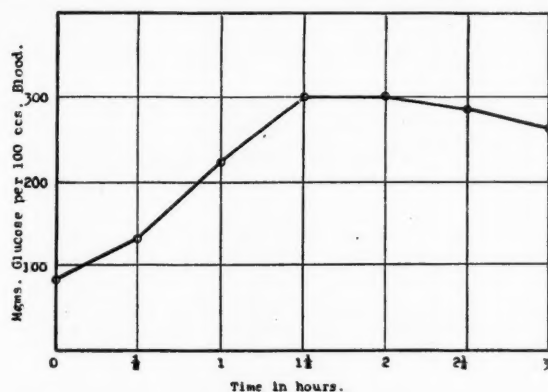
interval one gramme of vinca extract was administered *per os* to each of the rabbits and one hour afterwards adrenalin was injected. The extract had no influence on experimental adrenalin hyperglycæmia in these rabbits. The results obtained were similar to those of Lee and Drew,⁽⁵⁾ Epstein⁽³⁾ and Allen who also found that their respective plant preparations were unable to influence adrenalin hyperglycæmia in rabbits.

After the above experiments the rabbits were "spelled" for a week and to each of four of them one gramme of vinca extract was administered every day for five days. One hour after the last dose of extract adrenalin was injected. The results were similar to those of the first experiment. In addition vinca was further administered every day

for seven days to two of the rabbits, but the adrenalin hyperglycæmia was not modified.

Effect of Vinca Extract on Experimental Adrenalin Hyperglycæmia of Dogs.

Six fox terrier dogs were used in the following experiments. It was found that the subcutaneous injection of 4.5 cubic centimetres of a one in 1,000 solution of adrenalin would produce a definite hyperglycæmia, attaining its maximum in about an hour and remaining for at least two or three hours (see Graph II). Allen claimed that "Myrtillin" would definitely control this adrenalin hyperglycæmia. In our experiments we found that vinca, administered in one gramme doses one to two hours before or in doses of one gramme every day for ten days before the adrenalin injection, would not modify the course of the adrenalin hyperglycæmia.



GRAPH II.
Typical chart showing effect of subcutaneous injection of 4.5 cubic centimetres of one in 1,000 adrenalin solution in a dog. The administration of vinca extract failed to modify this curve.

For the blood sugar estimations McLean's method was used. The dogs' ears were shaved the day before (with a vigorous application of soap this is neither a difficult nor painful matter) and 0.2 cubic centimetre of blood was easily obtained from one of the large veins. We believe that in dogs this is a very satisfactory method of obtaining blood samples for microchemical methods of determining blood sugar, such as those of Hagerdorn and Jensen or McLean.

In view of the disappointing results obtained with the extract and also (see later) with the vinca leaf infusion we decided that it would not be worth while to spend time in treating patients with this extract.

Clinical Observations on the Use of Vinca Leaf Infusion in Diabetic Patients.

The following three groups of experiments were planned in order to detect any possible benefit in the diverse types of diabetes.

Experiments: Group I.

The first group of experiments was carried out on patients with mild diabetes who were receiving

small doses of "Insulin," which completely controlled their glycosuria, and in whom the food and "Insulin" requirements had been stabilized for at least a year.

CASE I: O.R., a medical student, had been under observation for two years. For the last year he had been taking seven and a half units of "Insulin" every day and his urine was keeping sugar and acetone free. For four weeks before vinca was administered, fasting blood sugar estimations were carried out every second day and the urine was tested after each meal. Vinca infusion was administered for four weeks. No favourable results were noted. There were no symptoms of hypoglycæmia and the blood sugar remained at the same level.

CASE II: W.P. was a plumber, aged forty-two years. He was a diabetic who had been under observation for six years and had been on "Insulin" for the last three and a half years. For the last eighteen months he had been on a diet of carbohydrate 58.5 grammes, protein 82.6 grammes, fat 181.5 grammes; the total calories were 2,197. In conjunction with this diet he was taking seven and a half units of "Insulin" every day. This patient was an ideal one for experimental purposes. His urine had been quite sugar and acetone free for a year and his condition was so well stabilized that an increase of three to four units in his "Insulin" dosage would produce symptoms of hypoglycæmia. After four weeks' vinca treatment no beneficial effects, as judged by the possibility of reducing the "Insulin" dosage, could be detected.

The above two patients were extremely suitable for purposes of experimentation. Both gave intelligent cooperation and in addition to their condition being mild, their "Insulin" and diet were so well adjusted that any indications for lessened "Insulin" would have quickly manifested themselves.

Though not observed for as long a period as the previous patients, the following one is instructive:

CASE III: M.B., a female, aged twenty-seven, suffered from diabetes of four years' duration. About eight months ago when she was four and a half months pregnant, she developed an acute acidosis and diabetic coma. "Insulin" was administered and later in the seventh month the pregnancy had to be terminated. After this she was given 30 (15 + 15) units of "Insulin" every day. This was gradually reduced to two doses of seven and a half units every day. For the last two months her urine had been sugar free and the fasting blood sugar had been within practically normal limits. For three weeks before vinca administration the urine was tested after each meal and found to be sugar free. Vinca infusion was administered for three weeks. The patient showed no alteration in her diabetic condition. No hypoglycæmia ensued. After three weeks' vinca treatment an attempt was made to omit the evening "Insulin" dose. Within four days sugar appeared in the urine and the fasting blood sugar rose from 0.106% to 0.170%.

We consider that in this case the vinca infusion had a very fair trial. The patient was a mild diabetic and if the claims made for vinca had been substantial it should have been possible to reduce the "Insulin" to the extent of seven and a half units.

Experiments: Group II.

The second group of experiments comprised the investigation of the effect of vinca infusion in diabetic patients who were not completely stabilized by a dietary and "Insulin" régime. This group comprises seven patients who had all been under observation for at least a year. All of these patients were taking "Insulin" in conjunction with a calculated diet, slight glycosuria being present either

persistently or occasionally. Their "Insulin" requirements fluctuated in such a way that if we attempted to control the glycosuria completely, troublesome hypoglycæmic reactions ensued. These individuals were allowed either to have a mild glycosuria or when occasion demanded it, their "Insulin" was temporarily increased.

It might be argued that if any benefit resulted from vinca treatment, it would, in view of the normal fluctuations in these patients, be difficult to assess the exact cause of improvement. On the other hand, any negative effect of vinca during a period of glycosuria would be positive evidence of the failure of vinca to ameliorate the patient's condition.

Only in one instance did any beneficial action of vinca appear to be evident. However, in this patient a natural improvement could not be entirely excluded. It must be admitted that relief of constipation which occurred, may have assisted in stabilizing this patient's condition. In eight of our patients constipation was a troublesome complication and fairly potent purgatives, such as calomel, had to be resorted to. Without any possibility of collusion all of these patients volunteered the information that vinca had greatly relieved their constipation. In the patient that appeared to be benefited by the administration of vinca, this symptom had been particularly troublesome and we think that its relief greatly improved the patient's general condition and indirectly the diabetic state.

In cases of this group evidence of improvement was sought for by estimating the total grammes of glucose excreted in twenty-four hours or by estimating the percentage of glucose excreted after each meal. These estimations were carried out for two to three weeks before vinca was administered and also during vinca administration which varied from three to four weeks. One patient of this group who had been taking vinca for three weeks, developed a fatal diabetic coma.

Out of eight patients in the above group the diabetic condition of one only was benefited by vinca administration and here it was not certain that the result was not indirect and probably due to the relief of the constipation.

Experiments: Group III.

The third group of experiments comprised investigation of the effect of vinca infusion on patients with diabetic glycosuria without acidosis. In this group⁽⁴⁾ we dealt with middle-aged patients. Glycosuria without acidosis is usually regarded as a mild form of diabetes and it was thought that any possible beneficial effect of vinca would manifest itself in patients of this group.

It was a rather difficult matter to find suitable individuals for a trial with vinca infusion. The glycosuria of most of the available patients was easily controlled on an adequate diet without "Insulin." Five patients, however, were given vinca therapy.

One patient with glycosuria without acidosis was starved until the urine was sugar free and a ladder

diet was given until its caloric value was 1,016 a day. Further increments resulted in glycosuria. The patient was kept on a diet of this caloric value for three weeks, during the last two of which vinca was administered. An attempt was then made to increase the diet, but without success.

In another similar case failure also occurred.

Three patients of this group who were taking "Insulin" in addition to a carefully adjusted diet, were carefully observed for two weeks, the urinary sugar being estimated as in previous cases. Vinca administration failed to control the glycosuria. In individuals of this group vinca had a pronounced effect in controlling constipation.

CONCLUSIONS.

1. An extract of vinca leaves, administered to fourteen diabetic patients, had no beneficial effect on the diabetic condition. In one other case in which vinca was administered, it appeared to diminish the glycosuria, but this effect was probably indirect.

2. Vinca acted as an ideal purgative in patients who suffered from constipation.

3. An extract of vinca leaves had no effect on the adrenalin hyperglycæmia of rabbits or dogs.

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CONTACT LENSES IN CONICAL CORNEA.

By J. RINGLAND ANDERSON, M.B., F.R.C.S. (Edinburgh),
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KERATOCONUS or conical cornea is one of the most difficult conditions to treat in ophthalmology. As a result of some dystrophic influence the exact nature of which is usually obscure, the central area of the cornea bulges forwards in the form of a cone. Glasses for a time may make useful vision possible, but irregular astigmatism soon appears which lenses cannot correct. Later the apex of the cone becomes opaque. As this degeneration usually commences during adolescence, its seriousness can be imagined. When useful vision can no longer be obtained with lenses, operation is indicated. Fuchs sums up his description of the various operations suggested as follows:

We must therefore be content if a moderate improvement of sight is secured by the operation. The operative

treatment does not always give a lasting result. . . All operations involve some risk, as glaucoma, iridocyclitis, cataract or possibly sympathetic inflammation may result from them.

This appears to be a more gloomy outlook than is justified, but, even so, the prognosis is far from bright. Occasionally improved health and the limited use of eyes appear to arrest the progress of keratoconus. More frequently it is arrested by some unknown cause, when a varying degree of damage has been done.

Müller, of Wiesbaden, was the first to make contact lenses with a central segment to cover the cornea and a peripheral area overlapping the sclera. This was a great advance, for without a segment to fit the sclera the contact lens would be moved by the lids; these lenses were blown. The next great advance came from Jena, where Zeiss began to grind lenses. During the last ten years they have gradually been perfected and now they add another to the long list of Zeiss's triumphs in optical skill.



Figure Showing Contact Lens on the Conical Cornea of the Right Eye. The lens is scarcely visible. The lower lid is drawn down by a finger.

They now supply a series of three or four trial lenses which one can try on the patient. The lenses cover the anterior two-fifths of the globe and the one giving best vision with the addition of a sphere in the trial frame, can be ordered from the firm of Zeiss. Each is a very delicate shell of a glass with a double curve. The diameter of the corneal segment varies from 12 millimetres to 13 millimetres and the radius of curvature from 6.5 millimetres to 9.0 millimetres. The number of clinical successes is numerous in German literature. They claim not only improved vision, but also a reduction of the conicity. The following history confirms the value of this method of treatment.

Miss V.B., *etatis* twenty, consulted me in March, 1927. Fifteen months before that she had had measles and pneumonia and was acutely ill. When she recovered, she found her vision to be very defective. To read even large print a book had to be held very close and, even then, the letters would blur. Prior to this her health and her vision had been good. Her mother, she said, was shortsighted. The vision of the right eye was $\frac{1}{60}$; with — 7.0 diopters, spherical, of myopia and — 6.0 diopters, cylindrical, of astigmatism at 5° it was $\frac{1}{24}$. The left eye saw $\frac{1}{60}$; when twelve diopters of myopia and eleven diopters of myopic astigmatism at 175° were corrected, $\frac{1}{24}$ (one letter). Stenopæic holes or slits were of little use. Each cornea manifested a typical though incomplete Fleischer

ring and in each nerve fibres were unusually clear. These were noticed with an ordinary loupe and later studied with the slit lamp. She was anæmic and the dentist removed one tooth with an apical abscess and several surrounded by pyorrhæa. She was given "Ostelin" and epinephrine and every endeavour made to improve her general condition. Six months later she was feeling better, had put on weight, but she could neither read nor sew. The margins of the left lids were sutured together and she was ordered calcium lactate and parathyroid extract. Six months later the right eye with 6.0 diopter spherical and a stenopæic hole read $\frac{1}{24}$ and the left eye could not be improved beyond $\frac{1}{60}$. Contact lenses were then tried. The right eye with a lens of radius 9.0 millimetres read $\frac{1}{6}$, partly through a sphere of + 6.0 diopter spherical in the trial frame. In June, 1928, the patient could wear this lens all day. At the end of each day the eye would be slightly red. At first it was necessary for the oculist to insert and remove the lens. The patient, however, was soon taught to do this and now without the slightest trouble inserts the lens under the upper lid whilst looking down and draws the lower lid over it. To remove it she places the bent end of a fine hairpin under the lower edge of the lens and easily removes it. At first she watched in a mirror while doing this, but now finds this unnecessary. Finally with the lens of radius 9.0 millimetres and a sphere of + 4.0 diopter spherical she could read $\frac{1}{6}$, partly and J2. The left eye with a lens of radius 8.1 millimetres and + 4.5 diopter spherical and + 0.5 diopter cylindrical read $\frac{1}{6}$, partly. The lens for the right eye was ordered and Zeiss ground on the anterior surface a curve equivalent to + 4.0 diopter spherical. The cost prevented her from buying a lens for each eye, so she wears her lens on each side alternately. Sometimes she fills the lens with normal saline solution before inserting, but as a rule she inserts it dry. The disadvantage of so doing is that a bubble occurs between the cornea and glass. This lessens while the eye is in position and interferes with vision very little. The elaborate method for inserting a contact lens recently advocated by O'Rourke⁽¹⁾ has not been used. Occasionally the eye becomes a little injected. However, on staining and examining with a powerful loupe, no evidence of epithelial damage has ever been found. This patient has worn this lens now for sixteen months without inconvenience or any corneal trouble.

The Zeiss lenses fit more accurately than Müller ones and so lend themselves to exact optical work. Accurately fitting spherical lenses cannot be blown. The fitting of the latter is more difficult, in that one has to try on a large number in attempting to find one that fits accurately. The Zeiss lenses fit so firmly that there may be considerable constriction of the conjunctival vessels in the vicinity of the limbus. An attempt to lessen the angle at the junction of the corneal and scleral parts is being made by Zeiss and this should obviate any trouble from undue pressure.⁽²⁾

References.

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Reports of Cases.

PERTHES'S DISEASE.

By F. W. CARTER, M.B., Ch.B. (Aberdeen),
Perth.

THE following case of Perthes's disease is worthy of record.

The patient was four years of age on January 14, 1927. The mother complained on January 4, 1927, that the child had developed a limp during the past two weeks. The limp was worse after rest and gradually improved with exercise. It was intermittent. At times the limp was absent for a day or two, but soon recurred. There was no pain.

The birth had been normal. The child was healthy until at the age of two years and a half it had had an attack of pertussis with *otitis media*. *Paracentesis tympani* had been carried out. Later tonsillectomy and removal of adenoid vegetations had been performed. The child had made a quick recovery to normal, sturdy health.

On examination it was found that the legs were equal in length. There was a slight limitation of abduction. There was no apparent atrophy of the buttock or thigh muscles. The temperature was normal.

An X ray examination was carried out by Dr. Donald Smith and in consultation with Dr. R. H. Crisp the diagnosis of Perthes's disease was made from the skiagram (see Figure I).

The treatment consisted in rest in bed. The patient was allowed to sit up, but not to get out of bed. The leg was placed on a back splint to limit movement. A nourishing diet was given and the child took the syrup of the iodide of iron and the compound syrup of the phosphate of iron three times a day.

X ray examinations were carried out at intervals of approximately three months. Definite progress was seen after six months. At twelve months the child was allowed to get out of bed in a caliper splint and special boot. After twenty-one months the patient was allowed free movement without any restraining apparatus.

On November 1, 1928, the skiagram revealed a small area of low grade sepsis in the neck of the femur, close to the epiphyseal line. There was no pain or tenderness and no limp. There was still slight limitation of abduction. The child's general condition was excellent. The accompanying skiagrams illustrate the process of repair. Seen in November of this year the patient has still very slight limitation of abduction; the general condition is excellent.

THREE CASES OF ABNORMALITY OF THE UTERUS.

By H. A. RIDLER, M.B., Ch.M.,

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Case I.

Mrs. A.B., aged forty-two years, had been married twenty-one years. She had one child, ten years of age, and had had no miscarriages. She was operated on for appendicitis through a mid-line incision. It was noticed that she had two uteri of normal size and shape, including a cervix for each. Each uterus had a round ligament tube and ovary on one side and a fold of peritoneum joined each uterus as in Figure I.

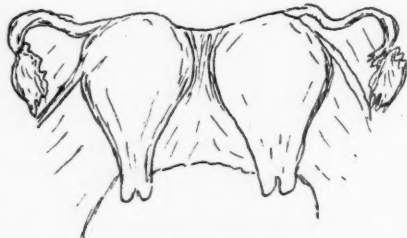


FIGURE I.

Case II.

Mrs. C.D., aged twenty-nine years, had three children, the youngest being five and a half years; she had had no miscarriages. She was operated on for a right tubo-

ovarian mass, having had a right salpingo-oophoritis due to a diplococcal infection. In the left broad ligament was a miniature uterus, one-sixth to one-quarter the size of a normal one. Attached to this uterus on its left side was a round ligament and a normal tube and ovary as in Figure II. It was impossible for the ascending infection to spread to this tube, as it had no communication with the normal uterus and consequently could not function.



FIGURE II.

Case III.

Mrs. E.F., aged twenty years, was pregnant for the first time, the pregnancy being of four months' duration. She had a severe toxæmia of pregnancy accompanied by hydramnios. When seen with a view to induction which it was decided should be done, the patient was threatening to miscarry which she did with the aid of a little pituitary extract. Before the patient miscarried it was noticed on vaginal examination that the lower uterine segment was of abnormal shape, being very broad or spread out; this



FIGURE III.

could not be accounted for. When the patient was under an anæsthetic for curettage for retained placental fragments, a second os was discovered behind the first, the first being the entrance to the uterus proper. The second os led into a cavity which extended nearly half way up the posterior wall of the uterus and which caused the spread-out condition of the lower part of the uterus.

Reviews.

THE HISTORY OF OPHTHALMOLOGY.

TREACHER COLLINS has again laid the medical profession and especially ophthalmologists under a debt of gratitude. His history of the Moorfields Eye Hospital is so altogether good and comprehensive that it may well be called a history of British ophthalmology.¹ There is not a dull

¹ "The History and Traditions of the Moorfields Eye Hospital; One Hundred Years of Ophthalmic Discovery and Development," by E. Treacher Collins; 1929. London: H. K. Lewis and Company, Limited. Demy 8vo., pp. 238, with illustrations. Price: 12s. 6d. net.

page in the book. Every ophthalmologist is therefore advised to consult the original and not only to read, but to possess it. It will prove a never failing mine of interest, delightfully and scientifically expressed. Included in the plates are twenty-one portraits of English founders of ophthalmology from Saunders up to the time of John Tweedy and William Lang. "The London Dispensary for Curing Diseases of the Eye and Ear" was the name under which Moorfields Hospital went at its foundation by John Cunningham Saunders in 1805. It was not until 1822 that the "London Ophthalmic Infirmary" was first erected at Moorfields. The hospital was enlarged in 1868 and again in 1875. In 1899 it was moved to the City Road because more space was required. It became "The Royal London Ophthalmic Hospital, Moorfields," in 1837. It is, however, still affectionately called Moorfields and will be called so, no doubt, to the end of the chapter, in spite of its new habitat in the City Road.

To adopt eye work as a specialty in the eighteenth century required, we are told, some courage, because it had become the province of travelling quacks. These men called themselves oculists. Of two of the most noted one was a tailor, the other a cobbler. "It was with such prating mountebanks that Saunders ran the risk of being confused." He was not, however, the first reputable medical practitioner in London to specialize in eye work. Dr. Wathen and Dr. James Ware preceded him. The former published a dissertation on cataract in 1785 and Ware in 1801 contributed a paper to the Royal Society upon the condition of a boy of seven years on whom he had operated for cataract by discision. As a result he was made a Fellow of the Royal Society. Appreciation is shown of William Mackenzie, of Glasgow, who published in 1830 "a masterly 'Practical Treatise on Diseases of the Eye,' which obtained world wide reputation." Mackenzie had established the Glasgow Eye Infirmary in 1824. He was the first, Treacher Collins states, to point out that in glaucoma there is increased tension in the eye and he endeavoured to relieve this by paracentesis.

All through the volume there are short references to the past masters of ophthalmology and their work, each of them sympathetic, appreciative, discriminating and at times affectionate. It is both interesting and astonishing to note the origins of beliefs and practices long before our present methods of precision were arrived at.

The discovery of the ophthalmoscope by Helmholtz in 1851 put ophthalmology on a scientific basis. It not only enabled the interior of the eye to be examined with exactness, but it led also to the study of refraction. William Cumming, however, a young surgeon working at Moorfields, had in 1846 foreshadowed the discovery of the ophthalmoscope and had pointed out that the fundus could be examined by reflected light, especially after the pupil was dilated with atropine. He died in 1853 at the early age of thirty-three years.

Charles Babbage, a distinguished mathematician and professor at Cambridge, fashioned in 1847 a plane mirror with the silver scraped off in the centre. He had adjusted it in a tube so that it could reflect light into the eye and he was able to see the interior of the eye. He showed it to Wharton Jones who was unfortunately myopic and did not see the fundus because the tube contained no correcting lens. The instrument consequently was laid aside as a mere toy.

Errors of refraction were discovered by James Ware who read a paper before the Royal Society in 1812. He even pointed out that hypermetropes requiring convex lenses to enable them to see both near and distant objects, differed from those who had been operated on for cataract in that these last required one lens for distance and another for near objects. He therefore anticipated Donders who did not clearly differentiate long-sightedness until 1859. We know, of course, that convex lenses were used in spectacles centuries before this.

The discovery and ultimate use of antiseptics upon which aseptic surgery depends for its success, is dealt with. May we not believe that the wonderful results in eye operations before Lister taught the need for asepsis and how to get it, were largely due to our physiological antiseptic, the secretion of the lachrymal gland? Bowman indeed foreshadowed this knowledge. He said:

The tears are a secretion . . . pure . . . They are poured out under cover in the right place, in quantity suitable to the need. Their useful and multiple office is performed in a way so simple and so perfect that no art . . . could pretend to equal it. We should ponder . . . and take heed that we do not hinder exquisite Nature by meddlesome or needless interference . . . but only lend it tender and judicious help by our dressings and our methods.

The attitude of the author is explained by the following sentence towards the end:

Most people will agree that the chief object in raking over the ashes of the past should be to acquire inspirations for the future and so, though it may be hopelessly out of fashion, the story will conclude with some maxims which may be deduced from all that has gone before.

Let us again recommend that the ashes raked by Treacher Collins from the past become a treasured possession of Australasian and other ophthalmologists.

CARDIOLOGY.

BRITISH medical writers are producing an excellent series of monographs in the "Recent Advances Series" and may be congratulated on their uniform excellence. "Recent Advances in Cardiology" is now to hand and is well abreast of the high standard set in previous volumes.¹ The reader gets a fine sense of mental satisfaction in being in touch with recent physiological and clinical thought and research, however quickly the point of view changes. The book also serves to check speculations and theories and supplies a bibliography of reference which is most useful for kindred workers. It particularly appeals to those who qualified fifteen to twenty years ago, to whom on account of the hurry of busy professional life is denied the time for keeping up with the great output of medical literature in specialized subjects, such as cardiology.

It is natural that the importance of the electrocardiograph and the particular type of information to be expected from its use in diagnosis and prognosis are stressed. It largely replaces the polygraph, as it gives information concerning the state of the ventricular muscle and the interpretation of arrhythmia is rendered simpler. Reliable portable types are now available, though still beyond the means of the average practitioner.

After a chapter on lines of advance in the past thirty years, thrombosis of the coronary arteries is considered. This condition is now recognizable clinically by the type of *angina pectoris* produced, characterized by the severity and duration of the attack of pain which is relieved only by large doses of morphine. It frequently gives characteristic electrocardiograms, known as the Pardee curves. No theory is advanced for these curves, nor explanation given of the discovery of coronary thrombosis *post mortem*, without a history of angina during life. The probable explanation is the slow closure of the vessel which allows of gradual collateral circulation being established.

Current theories of angina are discussed. The authors conclude that the pain arises in the myocardium, due to a sudden deficiency of the coronary blood supply. Myocardial infarction angina is an extreme example, caused by coronary thrombosis. It must be admitted that a thoroughly satisfactory theory for angina has still to be formulated. The authors urge the abolition of such terms as "secondary angina" and "*angina minor*," "pseudo angina" and so forth. However, they offer no suggestion in terminology for conditions described by Mackenzie as secondary angina, in which there is supposed to be an exaggerated receptor sensitivity produced by psycho-toxic factors.

In the differentiation of anginal pain, it should be recognized that the faulty use of the accessory muscles

¹ "Recent Advances in Cardiology," by C. F. Terence East, M.A., M.D. (Oxon), F.R.C.P. (London), and C. W. Curtis Bain, M.C., M.B. (Oxon), M.R.C.P. (London): 1929. London: J. and A. Churchill. Post 8vo., pp. 350, with illustrations. Price: 12s. 6d. net.

of respiration leads to their fatigue and exhaustion, causing tonic contraction and pain, with tenderness on pressure. Præcordial fibrosis and panniculitis may also simulate angina. Interpretation of left thoracic pain is a weighty responsibility and mistakes may have serious consequences. Gallop rhythm is another prognostic sign, with an obscure mode of production; it is regarded as depending on the time of maximum velocity of auricular filling, the rate of the heart, the degree of dilatation of the left ventricle and the weakened state of the myocardium. These factors are held to produce vibrations forming the third sound of gallop rhythm. The gravity of the sign is certain, but the mechanism remains obscure.

With reference to heart block, though the site of the lesion is in the auriculo-ventricular bundle, there are various physiological functions, such as refractoriness and supernormal recovery phase, which complicate some curves and make interpretation very difficult. Treatment of recurring Stokes-Adams attacks by subcutaneous adrenalin injections is valuable or ephedrine by the mouth. Intracardiac adrenalin injections may be necessary for a prolonged attack of unconsciousness. Barium chloride, 0.03 to 0.06 gramme (one half to one grain) taken three times a day, is sometimes effective in abolishing the fits.

Bundle branch lesions have been brought to light by the electrocardiograph, also so-called intraventricular block and inversion of T waves. All these have a prognostic significance, indicating types of myocardial degeneration. Auricular fibrillation and flutter are fully considered and a good survey is given of physiological theory and clinical facts, along with a useful consideration of the mode of action and use of quinidine. Digitalis receives a chapter to itself.

Circulatory failure occurs in two types, the central or cardiac and the peripheral. The circulation is invariably slowed in cardiac failure and edema; dyspnea and cyanosis have a definite relation to such slowing. The venous pressure is often high and the capillary stream is greatly slowed, even temporarily reversed in places. High venous pressure is well seen in the distended prominent external jugular veins, often pulsatile and may extend down to the arms, suggesting the advisability of blood letting. The back pressure theory has been largely abandoned in favour of myocardial deficiency.

Fraser's researches show that cardiac dyspnea is not due to deficiency of oxygen saturation of the blood nor to increase of arterial carbon dioxide. It is due to reduced quantity of blood to the respiratory centre, with consequent smaller supply of oxygen to the centre. It is only in terminal stages and usually with renal involvement that acid products and altered hydrogen ion concentration excite the centre. Estimations of vital capacity in heart failure are not regarded as of importance in practice, though commonly employed in American clinics. No better term has appeared to replace the form of paroxysmal dyspnea known as cardiac asthma which has nothing in common with bronchial asthma.

Failure of the peripheral circulation and the relation of the state of the capillaries have received much attention in recent years owing to the investigation of wound shock, bacterial infections and the local changes in capillaries, especially by Lewis. Unfortunately, there is no specific treatment for peripheral failure. Adrenalin and pituitrin are ineffective; transfusion of blood or gum saline solution may tide a patient over a crisis. In bacterial infections, when the effects are more prolonged, applications of cold or tepid water to the skin constricts the dilated vessels, thus stimulating the circulation, as well as lowering temperature. Hence the good results seen in enteric fever and sometimes pneumonia.

In the treatment of acute heart failure not only is rest essential, but restlessness must be checked and for this nothing surpasses morphine, except in severe toxæmia. It may be preceded by atropine, if there is congestion of the lungs. Morphine is a specific in cardiac asthma and often checks acute pulmonary oedema.

Blood letting is indicated for severe enlargement of the right side of the heart and relief is more efficient if the

withdrawal of blood is rapid; hence removal through a needle is less efficacious than by opening a vein with a lancet.

Gordon produced radiological evidence of diminution of the transverse diameter of the heart which did not take place in the healthy hearts of blood donors used as controls.

Meyer recommends the use of glucose, especially if there is any evidence of acidosis; 0.22 kilogram (half a pound) or more daily may be given.

"Novasurol," one of the newer diuretics according to Saxl and Hellig diminishes the tubular epithelial affinity for water and colloids, hence reabsorption is prevented and diuresis brought about. Ammonium chloride enhances its reaction. No theory is advanced for this or the use of calcium chloride. Ammonium nitrate is less nauseous. "Salyrgan" and "Euphyllin" are too recent to have received attention; also no mention is made of new synthetic circulatory stimulants resembling camphor. A useful summary of subacute infective endocarditis is given; treatment unfortunately is still ineffective.

Useful information will be found in the chapters dealing with the heart in diphtheria, pneumonia, anæsthesia, thyroid disorders, anæmia and pregnancy.

Three stages are described in high blood pressure and the heart and the factors are discussed. The irritable heart is only briefly handled and no reference to work later than 1925 is touched on. It is unduly optimistic to state that if the patient is reassured that his heart is normal, neurotic tachycardia will soon be cured.

The final chapters deal with X ray examination, the electrocardiograph and the diagnosis of the healthy heart. In an otherwise excellent volume we note the omission of the use of bismuth in cardio-vascular syphilis, of ethylene gas in anæsthesia, of "Luminal" in the neuroses and hypertensive conditions; nor is reference made to Cabot's "Facts on the Heart," 1926. Apart from such criticism, we can very heartily recommend this book to all practitioners of medicine.

AFTER TREATMENT OF OPERATIONS.

MANY of the surgical text books conclude their description of an operation with the closure of the operation wound and the reader is left with the feeling that his troubles are over when the last stitch has been inserted. Too often they are only beginning. In "After-Treatment of Operations" J. P. Lockhart-Mummery takes up the story from the end of the operation and guides the surgeon through the post-operative period.¹ In a concise and well-arranged hand book the routine management of patients with uncomplicated conditions is described and the emergencies and complications that may arise, are fully discussed. In the fifth edition the author has maintained the high standard of previous editions and the book may be recommended as a guide to after treatment and should prove especially useful to house surgeons and to those whose surgical experience is limited or occasional. A wide range of subjects is dealt with and the methods described are all well tried and firmly established in the practice of many surgeons. It is surprising that no mention is made of the value of iodine in the treatment of acute thyrotoxicosis following thyroidectomy and in dealing with post-anæsthetic diabetic coma the author makes no reference to "Insulin". Many surgeons may still agree that washing out the pleural cavity after thoracotomy for empyema is dangerous, but it is nevertheless a safe and valuable procedure in the treatment of selected patients. A comparison of the present book with the first edition published in 1903 gives striking evidence of the great change in our methods and the increasing insistence that is laid on the prevention of post-operative complications.

¹ "The After-Treatment of Operations: A manual for Practitioners and House Surgeons," by J. P. Lockhart-Mummery, F.R.C.S. (England), M.A., M.B., B.C. (Cantab); Fifth Edition; 1929. London: Baillière, Tindall and Cox. Crown 8vo., pp. 290, with illustrations. Price: 7s. 6d. net.

The Medical Journal of Australia

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The Laboratory and the Practice of Medicine.

A GREAT deal of the knowledge on which clinical medicine is based, has been acquired by experiment. The fundamental doctrines of biochemistry and biophysics are the products of laboratory investigations. The research worker has endeavoured to provide an accurate understanding of the relation of structure to function and has laboriously assembled facts concerning the development and growth of healthy tissues and organs. Pathology has been built up on the study of abnormal reactions and defective functions and of the influence of extraneous agents on tissues and organs. Information gained in the laboratory has been utilized by the clinician in the recognition of disease states and in the endeavour to prevent and cure disease. The medical practitioner is indebted to the research worker to a very large extent for the knowledge that enables him to follow his calling. In recent years the clinician has collaborated at times with the laboratory worker in the application of certain principles to the problems of medical practice. A few members of the medical profession in general or special practice devote a portion of their time to laboratory research work. The practising portion of the medical profession, however, takes a small share in laboratory investigations or the application of the findings of these investigations.

In our issue of February 1, 1930, Dr. Bolliger and Dr. Laidley recorded the results of a series of ingenious experiments having for their object the production in animals of a renal lesion analogous to chronic nephritis of human beings. In a further article Dr. Bolliger cooperating with Dr. Earlam will give the results of his continued investigation and experiment. The general practitioner may fail to recognize the importance of research of this kind

and may be inclined to relegate it to the library that he labels academic. Dr. Bolliger realizes that X ray nephritis is not identical with the form of acute or chronic nephritis encountered in medical practice, but he also realizes that he can eliminate varying proportions of the functioning renal epithelium in the dog and can demonstrate the effect on the organism when the remaining intact renal epithelium can just support life in the absence of unusual strain or extra metabolic load. The same problem is encountered in medical practice; a patient with damaged renal parenchyma may be able to live a quiet life, provided that his heart is prevented from throwing an additional burden on his kidneys and provided that the noxious process which led to the original renal disease, has ceased to exist. Clinical experience teaches the physician a great deal concerning the dangers attending such a condition, but much more can be learned from direct experiments. Dr. Bolliger has used his experimental method to test the safety or otherwise of the anæsthetic "Avertin" and has been successful in determining the amount of renal damage that may exist in a dog without rendering "Avertin" anæsthesia dangerous to life. Even if allowance has to be made for the physiological differences between man and dog, these experiments will have undoubted direct value in medical practice. The possibility of destroying or damaging one-half of the renal epithelium of an animal at will, without introducing disturbing complications, such as a toxic effect not limited to the kidney, gross trauma or excessive stimulation, opens up countless paths for exploration, all of which may have application to the problems of disease in the human being.

The medical practitioner of today is concerned with experimental work in the laboratory, partly because it may provide an explanation for processes that appear obscure and partly because the findings can be applied and provide some highly useful diagnostic or therapeutic method. Moreover, if he follows this work, his own observations in the clinic or at the bedside of his private patients may be used in supplementing the scraps of knowledge gained in a planned experiment. There is urgent need in Australia for coordination in research. Not every graduate is equipped by nature and by train-

ing for experimental work. It has been pointed out many times in these columns that a special temperament is needed for research, that not only must the individual possess the spirit of inquiry, but he must also be so engrossed in his studies that all his energy is spent in their pursuit. He must also have ingenuity and imagination. But even if the true research worker is relatively rare, there are many who can help in this form of work. Temporary positions could be created in any sound scheme of research for intelligent and ingenious young graduates. A couple of years in the laboratory would widen the outlook of any young graduate and give him a clearer understanding of his daily problems. In addition it would awaken his interest in the application of knowledge gained in the laboratory to the practice of medicine. He would thus become a valuable member of the team that will have to be established. It must never be forgotten that the final test of the correctness of any explanation of the nature of a disease is to be sought in the clinic and the *post mortem* room.

If research work is to be developed in Australia as it should be, each individual member of the profession must take an interest in what is being done and be prepared to contribute in some way to the success of the scheme. This interest will serve to protect the laboratory workers from harassing dictation and from want of freedom. It will insure the worker against waste of energy, since with coordinated effort, every investigation must be productive of some information and all knowledge is worth the seeking. We ask each reader to study the articles by competent laboratory workers in order that the first step toward the realization of a sound scheme of research may be attained.

Current Comment.

SLEEP.

SLEEP has been defined as the periodical state of rest in which voluntary consciousness and activity cease. It is obvious that this is satisfactory only up to a certain point. Sleep may be the result of the natural processes of life in a presumably healthy individual or there may be contributing factors of a pathological nature in a person whose bodily

health is below par. There is no more fascinating field of conjecture in the whole range of human function and none of the many explanations which have been advanced, can be regarded as proven.

A review of the subject has recently been made by Nathaniel Kleitman.¹ He has assembled the facts recently discovered and has put forward his own conclusions. He confines his review to work which has appeared since the publication of Piéron's book on the physiological problem of sleep in 1913. He points out that there is a number of conditions accompanying sleep, the so-called concomitants of sleep, and that the presence of most of these is considered essential in determining whether a certain state may be classed as sleep. These are a loss of critical reactivity to events in the environment of the individual, an increased threshold of general sensibility and reflex irritability and an ability of being roused and brought back to wakefulness. Kleitman in using the word sleep refers only to ordinary diurnal sleep, short day naps and similar conditions resembling normal sleep and fulfilling the three conditions just mentioned. He excludes hypnosis, narcosis and coma. Kleitman discusses the contributions to the knowledge of sleep under several headings and quotes the findings of various authors in some detail. It is not proposed to attempt an enumeration of the facts, but to refer to some of them as they affect the question of the causation of sleep. It will probably be most useful to refer first of all to the various theories of causation mentioned by Kleitman.

In the first place Piéron made a distinction between partial theories which explain the mechanism of going to sleep, and complete theories which explain the biological necessity of sleep. It is really impossible to consider the mechanism of going to sleep without paying attention to the biological necessity, for the factors causing the onset of sleep are to be regarded as biological processes going on in the individual and since they result in sleep, they have to do with the biological necessity. The first theory mentioned by Kleitman is that of Claparède who called sleep an instinct. Kleitman discusses this in a few words and characterizes Claparède's view as a collection of platitudes, mostly true, but contributing nothing to the solution of the problem. At the same time if sleep cannot be regarded as an instinct, there must at least be some genetic attribute which makes man a monophasic animal and other animals, such as the rabbit, polyphasic. Rabbits have sixteen to twenty-one regularly spaced rest periods in each twenty-four hours. The next theory which Kleitman disposes of, is the brain anæmia theory. He states that the carefully controlled recording by Shepard of brain volume changes in two subjects during sleep who had trephine holes in the skull, "should serve to bury once and for all the still current notions of a cerebral anæmia in that condition." This is a definite and sweeping statement. It may be asked

¹ *Physiological Reviews*, October, 1929.

in all seriousness whether any estimation of brain volume through trephine holes would be sufficiently accurate to reveal a blood diminution of such magnitude as would affect a cerebral centre or cerebral connexions. In addition, if the anæmia theory is to be discarded, some other explanation will have to be found for the well known fact that peripheral or splanchnic dilatation by hot baths or hot drinks or food will often produce sleep in a person suffering from insomnia. Pavlov's view that sleep is due to a general inhibition of the cerebral cortex is regarded by Kleitman as far from satisfactory. He points out that sleep may last for a short or a long time and he asks what it is that determines its duration. He also adds that while Pavlov and his associates regard the onset of sleep as a form of inhibition, it may be and is looked upon by many as an active conditioned reflex, especially as far as the habit of going to sleep under certain conditions or at a certain hour is concerned. He regards as a physiologically more acceptable explanation of the onset of sleep that given by G. T. Johnson, though it is not based on any experimental data. Johnson assumes that there must be a special apparatus responsible for sleep, since sleep is an important function. The centre, made up of "sleep" neurones, must be in the cerebral cortex, because sleep manifests the features of learning by experience and habit formation and these features are characteristic of cerebral activities. The products of katabolism activate the sleep centres and these inhibit the other cortical neurones. While Kleitman sees no objection to Johnson's scheme from the theoretical standpoint, he does not accept the latter's idea of the manner of activation of the cortical sleep centre, since sleep may be indulged in at all times and habits can be established in connexion with the manner, the time of onset and the duration of sleep. He makes merely passing reference to the view of Lust that anything that will affect the heat regulating mechanism, will produce sleep. His own theory is outlined as follows: (i) Sleep is an easily reversible inactivity of the highest functional centres of the cerebral cortex. (ii) The inactivity is due to a functional break between the cerebral cortex and the other parts of the nervous system. (iii) The functional break results from a definite decrease in the number of afferent impulses from the sensorium, especially proprioceptive impulses which depend on the degree of muscle tonus maintained. (iv) Sleep is due to the fatigue of the neuro-muscular mechanism concerned in the maintenance of muscle tonus. (v) In the absence of such fatigue sleep may result from complete muscular relaxation, intentional or unintentional. (vi) Diurnal alternation of wakefulness and sleep is a conditioned phenomenon.

Kleitman's view includes much that is acceptable, but additional understanding may possibly be gained by further consideration. Although he has not considered narcosis, it is of interest to contrast this condition with normal sleep. In sleep the

cutting off of the cerebral centres or, as Kleitman calls it, the functional break may not be complete. This is evidenced by the dream state and by the response of the sleeper by facial and other movement to sounds or touch, although the response is not remembered. In narcosis the cutting off is complete. When a person is anæsthetized with ether, unconsciousness results after a certain concentration in the blood has been attained; probably this is the effect of the action of the ether on the lipoid of the cell. When a person becomes tired after bodily exertion and wishes to sleep, fatigue products, such as lactic acid, are circulating in the blood. These products, when they reach a certain concentration, will act on the sleep centre, whether this be cortical or subcortical. Sleep may be caused by other agents in the blood. The sleep of an alcoholic person is due to the action of the alcohol on the lipoid of the cerebral cells. Again, in regard to heat, the well known experiment of Meyer showed that heat affects the cerebral cells. When a frog is put into hot water (at 40° C.) it promptly goes to sleep. If it is then transferred to water at 16° C., it awakens at once. If it be put back into the hot water, it goes to sleep again. This may be repeated any number of times. The production of sleep is not solely the result of the action of waste products. Other factors enter into the mechanism. It may be simpler to regard the waking state as something analogous to an electric circuit which may be broken at several points by several agencies. The constant stream of impulses from the various sense organs to the cortex is important in keeping the circuit intact. When a person goes to bed, sight and sound are excluded, muscular relaxation takes place and the cerebral cells become affected by products of katabolism. This is why it is possible for an individual to train himself to sleep at certain times and under certain conditions. If he endeavours to keep the circuit intact by continued action of the impulses from the sensorium, there comes a time when the circuit is broken by the action of the products of metabolism which have accumulated in unusual quantities. It is, moreover, well to remember the possible influence of endocrine glands. The person who suffers from hypopituitarism, falls asleep on the slightest provocation. A good case could be made out for the view that the pituitary gland acts as a coordinating or controlling agent in the regulation and production of sleep. Again, Kleitman's summary condemnation of Claparède notwithstanding, the share taken by the purely psychic element, regarded by psychologists as important, cannot be determined.

Enough has been written to stimulate interest in this subject and to demonstrate that in the treatment of insomnia an endeavour must be made to study the individual, to determine what there is in his activities which keeps intact the circuit of wakefulness, if such a term may be used. No mention has been made of suggestion and autosuggestion. These are important and their place will readily be recognized.

Abstracts from Current Medical Literature.

BACTERIOLOGY AND IMMUNOLOGY.

The Examination of Stained Films in the Tropics.

R. KNOWLES, HUGH W. ACHON AND B. M. DAS GUPTA (*Indian Medical Research Memoirs*, Number 13, June, 1929) discuss the puzzles and fallacies in the examination of stained films in the tropics. Though there have been frequent references to this important subject in the literature, the authors know of no standard paper in English or French, apart from the invaluable paper by Balfour (1911) which is now out of print. The authors regard the time as opportune to gather together for publication in one paper their experiences in the matter over a period of twenty years. Errors due to faulty technique are dealt with first. Wet fixation by Schaudinn's fluid and staining by some such method as Heidenhain's iron-haematoxylin yield more reliable results than the Romanowsky methods, but the latter are so universally employed that it is with special reference to them that the subject is considered throughout the paper. Errors in the collection of the material may lead to the appearance in the film of such organisms as staphylococci or Unna's bottle bacillus through the skin puncture having been made in an infected area. Intestinal bacteria or protozoa may be evident in blood taken from the abdominal cavity of a bird or animal which has been shot. The *Spirocheta bovis cafferi*, first described by Nuttall in 1910, is probably an example of this. The presence of cilia from ciliated epithelium may be a source of confusion. Haemolysis may result if the skin surface at the site of puncture be moist with sweat. In old slides herringbone scratches are common; stain is apt to be deposited on these and to cause trouble to the beginner in laboratory work. A rarer type of degeneration in slides and cover slips appears as a clear cut circle with a central dot resembling a minute karyosome. A frequent source of fallacies is the preparation of films on slides which have been previously used and not properly cleaned. The authors mention having seen specimens of *Hepatozoon maris* in a human blood film and explain its presence by the fact that the wet stained film had been dried with the same piece of blotting paper as had been used for drying a stained film of rat's blood. Cotton fibres have been mistaken for blood parasites, notably microfilarial. In a badly spread blood film the remains of red corpuscles or pieces of fibrin may resemble spirochaetes; distorted platelets or nuclear remnants may be a further source of confusion. Errors are apt to arise in the dry fixation of a film in a hot,

dry climate. *Plasmodium tenue* Stephens is probably really *Plasmodium falciparum* and an example of the distortion possible under these conditions. Callanan (1926) has shown that tenue forms are not present in fresh preparations, that their occurrence in the film is limited to the zone where the erythrocytes lie singly and that they may be produced artificially by pressure. The authors mention that the Kurloff body in guinea-pig blood films and the supposed new genus *Councilmania* in faeces as examples of errors in fixation. Perhaps the greatest volume of errors is due to atmospheric contamination and storage of films. Protozoal cysts, pollen grains, yeasts and fungi may contaminate the film from the air. The *Cryptococcus mutilans*, described by Breinl as a possible cause of gangosa, is probably an example of aerial contamination of the actual pathological lesion. Faulty technique in staining has been responsible for many errors. *Trypanosoma melophagium* in the sheep head and the X bodies of Horrocks and Howell are quoted as examples of stain deposit. Abnormalities and degenerations of blood cells, Cabot's rings, Howell-Jolly bodies, pessary bodies *et cetera* are discussed. Errors and fallacies in the examination of animal, bird and reptilian blood are described and explained. Illustrations consist of seven plates.

The Schick Reaction and Circulating Antitoxin.

A. T. GLENNY AND HILDA WADDINGTON (*Journal of Pathology and Bacteriology*, April, 1929) suggest a slight modification of the multiple Schick test. This test has been used by Glenny, Hopkins and Pope to determine the immunity produced by toxoid and concentrated toxoid in guinea-pigs by injecting them intracutaneously with 0.2 cubic centimetre of varying dilutions of diphtheria toxin representing one, two, four, eight, sixteen and thirty-two times the Schick dose. The authors suggest that where it is impossible to fix the degree of immunity expected, preliminary injections be given at wide intervals of dosage, either one Schick dose tenfold and one hundredfold or one-tenth Schick dose onefold and tenfold. Twenty-four hours later a series of injections is given at closer intervals, the levels being determined by the readings of the previous day's injections. There is some evidence to show that the ratio of antitoxic content to toxin tolerated is slightly lower if the degree of immunity is high. Large reactions can be avoided by the use of toxins chosen, so that the specific toxicity of the dilutions used is the same as that of the routine Schick dilution, but the combining power is greater. A concentration of antitoxin in the blood of one two-hundred-and-twentieth of a unit per cubic centimetre of serum corresponds to the level of failure to react to the Schick test in guinea-pigs. In passively immunized animals

this correspondence is not attained until equilibrium is reached between the circulation and tissues many hours after the injection of the serum.

The Toxins of Haemolytic Streptococci.

GEORGE F. DICK AND GLADYS HENRY DICK (*The Journal of the American Medical Association*, December, 1929) report the result of investigations undertaken to decide whether the soluble toxins produced by scarlet fever and by the haemolytic streptococci of erysipelas are immunologically specific and distinct. The skin test dose of erysipelas toxin having been established, five hundred persons, aged from four months to sixty-eight years, were tested simultaneously with one skin test dose of scarlet fever toxin on one arm and one skin test dose of erysipelas toxin on the other. No relation between spontaneous immunity to scarlet fever toxin and spontaneous immunity to erysipelas toxin was indicated by the results. One hundred convalescent scarlet fever patients whose skin had failed to react to scarlet fever toxin, were next tested with one skin test dose of erysipelas toxin. Results furnished no evidence that an attack of scarlet fever conferred immunity to erysipelas toxin. Twenty-four persons susceptible to both toxins, as indicated by positive skin reactions, were immunized by subcutaneous injections of graduated doses of sterile scarlet fever toxin. After immunization they were retested with scarlet fever toxin on one arm and with erysipelas toxin on the other. The skin response with scarlet fever toxin had changed from positive to failure to react in all cases while the positive reaction to erysipelas toxin persisted. It is suggested that errors in the neutralization of the toxins used in the skin tests have accounted for some of the instances of cross-neutralization reported.

Gram Structure of Cocci.

JOHN W. CHURCHMAN (*Journal of Bacteriology*, December, 1929) gives details of further observations on the basis of the Gram reaction of cocci. He noted that aqueous suspensions of certain species, exposed to 52° C. for ten hours or more, completely lose their Gram reactivity. This was accompanied by diminution in size and by a loss in weight. This reversal of Gram reaction is not a death phenomenon, as staphylococci killed by boiling do not lose their power of retaining the stain. In studies carried out on *Bacillus anthracis* it was shown that the Gram reaction rests on an anatomical basis and that the essential part of all bacteria is Gram negative and that Gram positivity is a function of a superficial layer which Gram negative bacteria do not possess. The author suggests as a working hypothesis that all bacteria may be placed in a Gram scale at one end of which stand the constantly Gram negative organisms and at the other end the constantly Gram positive. At

a certain place in the scale Gram negative character disappears. The Gram positivity of many organisms, however, can be reversed and this reversal is accompanied by a structural change. Certain organisms contain in any given culture some individuals which are Gram negative, some Gram positive and some indeterminate. The Gram positive organisms have presumably developed a complete cortex, the Gram negative organisms have no cortex, while the intermediate organisms have developed an incomplete rudimentary cortex.

The Exotoxins of *Staphylococcus Pyogenes Aureus*.

F. M. BURNET (*Journal of Pathology and Bacteriology*, October, 1929) records the result of the study of the exotoxins of *Staphylococcus pyogenes aureus*. Most of the toxins used were derived from a strain isolated from a patient suffering from extensive burns. As a bacteriophage whose action was almost confined to this strain, was available, it was easy to make sure that organisms isolated from an experimentally infected animal were of the same strain. The toxins were produced in broth made according to Parker's formula with a stock peptone to which 10% filtered ascitic fluid was added. Fifty cubic centimetres of this medium were inoculated and incubated for five or six days in a McIntosh and Fildes anaerobic jar in which 10% of the air had been replaced by carbon dioxide. At the end of this time the culture was passed through a Seltz filter and the filtrate stored in the ice chest. The author forms the following conclusions: The agent obtained in staphylococcal culture filtrates that is capable of killing rabbits acutely on intravenous injection, is a true exotoxin. The three activities of such filtrates in causing hæmolysis *in vitro*, necrotic skin lesions on intradermal injection into rabbits and acute death of rabbits after intravenous injections, are manifestations of a single antigenic substance. A typical anatoxin can be obtained with full antigenic powers, but no toxicity and diminished hæmolytic powers. The toxin is produced *in vivo* in rabbits infected with a toxigenic strain of staphylococci. If rabbits are actively or passively immunized to the toxin, their survival time after intravenous injection of virulent staphylococci is increased.

Protection Tests with Serum of Persons Recovered from Yellow Fever.

N. PAUL HUDSON, CORNELIUS B. PHILIP AND GORDON E. DAVIS (*American Journal of Tropical Hygiene*, July, 1929) furnish an additional report on their experiments in the immunization of monkeys (*Macacus rhesus*) with serum of persons recovered from yellow fever and refer to their former communication on the same subject in the *Journal of Tropical Hygiene*, January, 1929. In their former experiments some of the

Brazilian sera failed to confer immunity against West African yellow fever, possibly on account of deterioration due to faulty package and storage and the time occupied in transport *et cetera*. In the present series of experiments the serum was obtained and dispatched under more favourable conditions. Only one of the American samples failed to confer immunity when massive doses of virus were used and even this one succeeded when inoculation was effected by mosquito bite. One West African serum failed to protect in one instance, but succeeded in six other experiments. The authors consider that the experiments confirm their previously formed conclusion that African and American yellow fever are identical.

HYGIENE.

Sleeping Sickness in Tanganyika.

GEORGE MACLEAN (*Annals of Tropical Medicine and Parasitology*, April 26, 1929) discusses the relationship between economic development and Rhodesian sleeping sickness in Tanganyika Territory. Formerly there was little sleeping sickness in this territory, but since the war there have been three large outbreaks. The explanation is to be found in the varied mode of life of the native inhabitants. Formerly large communities were the rule. There were large areas of tilled or grazing land and the virgin forest with its tsetse breeding places was at a distance from the community. Contact between tsetse and man was therefore rare. With the advent of more advanced civilization the country became peaceful, intertribal warfare ceased and the necessity for large communities no longer existed. As a result numerous small communities have split off from the larger ones, the areas of tilled or grazing land are smaller and the forest has crept closer to what remain of the older settlements. Labourers, recruited for developmental work, frequently do not return to their former homes. The late war played a great part in the disintegration of many settlements. In many communities the tsetse problem originated only after the passage of the army of one of the combatant nations. The breaking up of the larger settlements and the formation of small communities with a minimum of grazing and farming activities permit frequent contact between man and tsetse. The author expresses the opinion that successful agriculture is one of the most powerful weapons that can be at present employed against any tsetse of the *morsitans* group.

Absenteeism in Coal Miners.

H. M. VERNON AND T. BEDFORD (*Journal of Industrial Hygiene*, March, 1929) have analysed the statistics of total time lost for the years 1920 to 1926 and of time lost by accidents for the years 1924 and 1925 among the

British coal miners. The sickness data over a period of twenty-one months in 1924 to 1926 were obtained at seven of the collieries investigated. In all 280 sets of observations of air temperatures and velocities at the coal face and 191 in the haulage roads were made. The absenteeism has been plotted in relation to depth of workings, temperature and air velocity. Accident incidence is shown in relation to air velocity, temperature and that due to falls of coal in relation to thickness of seam. Voluntary absenteeism is plotted in relation to distance walked from the pit bottom to working place and in relation to labour turnover. The sickness incidence is found to rise in a fairly uniform manner coincident with rise on both a wet and a dry bulb temperature and also with a rise of air velocity at the working face and in other underground places. This somewhat surprising fact is explained by the tendency of the men to catch chills while stripped to the waist and sweating. Accidents due to falls of coal are found to increase in incidence rate with thickness of seam and rise in temperature. Accidents due to other causes show a less definite rise under the influence of temperature. The age incidence of accident frequency and severity is high at twenty years, falls towards forty and then rises with increasing age. This rise is very much steeper in relation to severity. Voluntary absenteeism is shown to depend definitely on the conditions of work. As the men are paid by piece rates, the time lost in walking from the pit bottom to the working face is resented and a reflection of this discontentment is evidenced by an increase in voluntary absenteeism.

Women and Girls in Industry.

R. H. B. ADAMSON (*The Journal of State Medicine*, February, 1929) has investigated the truth or falsehood of the statement frequently made in the lay press that industrial work is intrinsically harmful to the anatomy of the female human being herself and conducive to bad obstetric results if she later bears children. Work is hard for factory women, whether married or single, as paid work in a factory does not relieve them from the necessity of doing the domestic work at home after factory hours. There is very little leisure in their lives for playing in the open air or frequenting places of amusement. During the course of routine medical inspections certain general observations were impressed upon the author. Acuity of vision should be tested with a needle and thread as well as the usual Snellen's test types for those women who have forgotten how to read. Defects of vision are common, leading to headache among the hypermetropic from eye strain caused by close work or bad work among the myopic. Dysmenorrhœa is common in shop girls and girls in sedentary occupations and is rare in active factory workers who move about at their work. Physical defects

after child-birth have been found to be frequent for two reasons, first, that so many women bear children without their professional obstetric attendants taking steps to prevent and repair tears of the perineum, vagina and cervix and, secondly, that these women are so ignorant as not to demand better attendance on themselves in child-birth. The general public, especially the male members of the community, appears to take it for granted that a woman who bears a child, must inevitably be damaged for life. Work is in no way conducive to sterility and even appears to render some more fertile. Medical inspection on engagement is money well spent and brings in a considerable return in greater efficiency of work. It is hoped that the time will come when employers of labour will insist on physical fitness as shown by medical examination before engaging their staff. The author considers there is no inherent incapacity for hard work in women as a sex. Public opinion and legislation would be more advantageously employed in striving towards better midwifery for the women of the country to keep them fit for such work. This is much preferable to the acceptance of *post partum* disabilities and the closing of the door in the face of all women who in many instances may never know motherhood, against employment in the more highly skilled and better paid trades.

Katathermometer Readings at Rangoon.

F. G. JOLLEY AND V. W. FENN (*Indian Medical Gazette*, June, 1929) publish the readings of dry and wet bulb thermometer and dry and wet bulb katathermometer made every week during the year 1927 in Rangoon. The readings were taken between the hours of 10.15 and 11.30 a.m. in a room measuring 9.75 metres by 7.9 metres by 4.27 metres with its main openings facing north and an external wall facing east. Five windows and two doors giving a ventilating area of 168 square metres were open at the time the observations were made. In the season of hot weather the mean readings were: Dry bulb 29.1° C., wet bulb 21.75° C., dry katathermometer 2.51, wet katathermometer 11.59. In the rainy season the respective mean figures were: 30.3° C., 28.75° C., 3.17 and 10.61 and in the cool season 28.15° C., 21.75° C., 4.80 and 16.37. Leonard Hill's standard of comfort for sedentary work, that is, dry katathermometer not below 6 and wet katathermometer not below 18, was attained on only four occasions during the year.

Preventive Measures Regarding Influenza.

P. SCHMIDT (*Deutsche Medizinische Wochenschrift*, January 25, 1929) discusses the possible means of preventing spread of infection during influenza epidemics. This is difficult to attain because of ignorance of the finer

points regarding infection. It is generally assumed that infection occurs from inhalation of fine droplets of secretion through the mucous membrane of the upper air passages or the eyes. Direct infection of the trachea by coughing has not been conclusively proved and failure resulted in the author's experiments when cultures were directly sprayed into the throat. Infection of the eyes and nose by contact with fingers plays a large part in spreading the disease. But the major source is mass infection from coughing when people are congregated in crowds, especially in buildings. This is more important than changes in the weather. Ignorance and indolence of the general public counteract the success of preventive measures on a large scale. Advice should be given for patients to go to bed when the attack starts and for those mixing with their fellows explicit instructions should be issued regarding coughing into handkerchiefs and washing the hands before meals. Nasal and oral disinfection should also be taught and crowds and meetings avoided. The author recognizes that the average layman will disregard these elementary principles, unless severe epidemics are prevalent.

Silicosis and Tuberculosis.

E. R. HAYHURST, D. J. KINDEL, B. E. NEISWANDER AND C. D. BARNETT (*Journal of Industrial Hygiene*, September, 1929) have made a survey of 919 workers employed in two sandstone quarries in northern Ohio. The examination was made in 1926. As 75% of the employees reside in two small villages close at hand, the labour turnover among the older men is small, but considerable among the younger workers. Stereoscopic radiographs were taken of the workers; seven of the films were not decipherable. Of the total 260 or 28.5% were diagnosed as suffering from one stage or another of silicosis and 233 or 26.1% were found to have pulmonary fibrosis. Of the silicotic conditions only 13 or 5% were complicated by tuberculosis (1.4% of men examined) and five persons or 0.5% were found to have simple pulmonary tuberculosis, making a total of 1.9% with tuberculosis. This last figure is practically the same as the usual tuberculosis incidence among the average industries in the United States of America. The average exposure in years ranged from 16.24 for commencing silicotics, through 21.82 for those with moderately advanced conditions, to 27.05 for those whose disease was advanced. Those with complicated silicosis had on an average been exposed for 16.15 years. In view of the high silica content of the stone worked, 92% to 97%, this delay of onset is regarded as remarkable, the period being over twice that reported by the South African investigators. Very few of the patients reported symptoms and the incidence of disability was very low. Investigation

of the tuberculosis death rate for the village compared with the surrounding country, however, showed that it was twice as high and also 70.6% in excess of that of a neighbouring industrial city. The county death rate from tuberculosis is much lower than that for the rest of the State of Ohio and the village incidence of tuberculosis in this instance is considered to approximate that of an ordinary industrial city. Comparison is made of the findings in this inquiry with those of Australian, British and other American investigations. Careful petrographic studies made of the rock, showed that the crystals of silica are obtuse rather than acute angled and that the matrix, 3% to 8% of the mass, is composed of carbonates, silicates, kaolin-forming substances and sulphides and oxide of iron. It is suggested that the explanation of the high incidence of silicosis with the low incidence of tuberculosis may be found in the petrographic characteristics of the rock.

Practical Bored Hole Latrine Construction.

CLARK H. YEAGER (*Malayan Medical Journal*, June, 1929) describes a method of boring holes for tube latrines. The end of a piece of iron piping, 4.8 centimetres thick and 4.87 metres to 6.7 metres in length, is halted to the arch of a 41 centimetre post hole augur. A cross wrench of 3.8 centimetres iron piping, 2.43 metres in length, is used for turning the augur. A tripod, fitted with block and tackle, facilitates lifting the augur when it becomes filled with earth. A pair of hinged doors on a wooden frame may be used for holding the shaft vertical. A semicircular notch is cut out of the edge of each door. The doors are laid flat on the ground and closed over the hole in the earth, the shaft of the augur passing through the opening formed by the semicircular notches. The tube is bared to a depth of about six metres. It is best to reach a point about one metre below ground water level, but this type of latrine is superior to the ordinary dug pit latrine, even if water is not reached. A long basket, made of laced split bamboo may be thrust down the length of the tube in localities in which the soil is apt to crumble. Using the methods described, four coolies who had never previously used an augur, bored a hole six metres deep in three hours in stiff soil without fatigue. Illustrations of the implements and methods of using them are given.

Tuberculosis in Industry.

BERNARD S. COLEMAN (*Journal of Industrial Hygiene*, September, 1929) makes a plea for concerted action against tuberculosis in the industrial community by the detection of early infections from medical surveys, supervision of the tuberculous and proper after care and rehabilitation of those discharged from treatment. He describes the antituberculosis activities

in Hudson County, New Jersey, United States of America. The population of this county is 725,000 and of these 112,000 men and women work in 2,350 industrial establishments. In February, 1928, an industrial health service was begun under the ægis of the Hudson County Tuberculosis League. This service conducted a preliminary medical survey of workers, 80% of whom voluntarily submitted themselves for examination. Of 1,099 persons examined 10.6% had no demonstrable defects, minor defects occurred in 54.8%, advanced minor defects in 26.3% and major defects in 8.3%. Chest conditions were observed in 123 persons; 54 of these were diagnosed as requiring observation and three conditions were definitely tuberculous. The commonest defects were defective teeth, gums and tonsils and increased blood pressure. In cooperation with the local tuberculosis clinics, patients with pulmonary conditions were advised to present themselves for further examination and treatment. It was found that 14.9% only of the 2,350 industrial establishments had any sort of medical service and the majority of these merely had a physician on call. Following the League's demonstration by means of this survey of the value of medical services, those controlling the industries will be asked to take over the work on a definite plan. This plan divides industries into groups comprising 1,000 workers each. Each plant sharing the unit service is to provide a first aid service in the plant and to contribute *pro rata* to the cost of the unit. The functions of each unit include the physical examination of employees, first aid and instructions therein, industrial hygiene and sanitation and health education. Two such established units have already been taken over in Philadelphia.

The Composition of Water and Mosquito Breeding.

W. RUDOLFS AND J. B. LACKEY (*The American Journal of Hygiene*, January, 1929) believe that it is reasonable to assume that the composition of water is closely related to the breeding of mosquitoes in general and to the breeding of specific species of mosquitoes in particular places. The mosquitoes which breed in salt water, do not breed as a rule in fresh water and *vice versa*. The reasons for mosquito breeding in specific places are, however, not known, neither the effect of certain components of the water nor the specific factors which influence breeding, although during the last few years several investigators have attempted to show that certain factors affect or govern breeding. In the present study an attempt has been made to correlate the chemical composition of water and the biological growth contained in it with the abundance of mosquito breeding. Two definite pools were selected, one which

has bred mosquitoes for a number of years, and another in which, according to records, no breeding or only sparse breeding occurred. In connexion with this study *Culex pipiens* larvæ were introduced into rain water and waters collected from certain drainage areas. In certain cases the reaction of the water was artificially changed and suitable food added. Larvæ died within a short time in cedar swamp water if an insufficient food supply was added. They were killed within twenty-four hours when the reaction of natural water was changed rapidly. A gradual change of the reaction of the water did not appreciably affect the death rate of the larvæ. *Anopheles canadensis* larvæ were present in a pool with either high or low total acidity, with free carbon dioxide of four and forty parts per million with five and seventy-five parts per million chlorides, with two and one hundred and twelve parts per million sulphates, with high and low acid carbonates, free ammonia and albuminoid ammonia. The carbon nitrogen ratios of the water did not seem to affect breeding. Whenever the amounts of diatoms, protozoa, fungi *et cetera* were low, breeding was absent. Breeding occurred with high and low total numbers of bacteria. There was a difference in decomposition of mixtures of muck and partially decayed vegetable matter obtained from the bottoms of the different pools. It is possible that under certain circumstances water with low pH values is more favourable to mosquito breeding than water with medium or high pH values and *vice versa*. It appears that specific substances either present in the water or produced by the decomposition of vegetable matter may be responsible for the growth of microorganisms and subsequently for the breeding of mosquitoes.

The Grading of Particulate Matter.

DONALD E. CUMMINGS (*Journal of Industrial Hygiene*, September, 1929) found that in order to test quantitatively as nearly as possible the various theories offered in explanation of the cause of the pulmonary changes encountered in silicosis, the first requirement was to obtain specimens of dust of the sizes found in silicotic lungs. The author's investigation is being carried out at the Saranac Laboratory for the Study of Tuberculosis. He discusses the various methods in common use for grading dust by suspension in air or liquid and withdrawal of the sediment or drawing off the supernatant fluid. The following points are important for obtaining the best results by the sedimentation process: uniform dispersion of the dust in the suspending fluid is necessary; recovery of sediment yields better results than recovery of the layers of the suspension; the choice of the suspending fluid should depend on the range of particle sizes required; the container should be broad and shallow; temperature should be uniform to avoid

convection currents. In the experiments reported a water-alcohol mixture was used, the alcohol aiding in wetting the particles thoroughly, clumping thus being avoided and on account of the lowered surface tension the sediments adhere more firmly and contamination of the supernatant suspension is thus avoided. Suspensions up to 2% may be used. The dust is dried by heat and then screened to eliminate larger particles. The technique subsequently adopted involves the making of the suspension and subsequent decantation at increasing periods from half a minute to four days from one vessel to another. Dust remaining in suspension after four days is in such violent Brownian movement that it will remain suspended for practically an indefinite period. To clean the fractions of successive suspensions from finer particles requires further washing and suspension of each grade of sediment, while the supernatant fluid of each washing is decanted into the next dish. The process must be repeated until a clean supernatant fluid is obtained for each dish in the settling interval. Alcohol is omitted after the third sedimentation. The final sediment is then dried and transferred to glass stoppered bottles. Microscopical examination is used to check thoroughness. Three to five washings usually suffice. The description of the technique is followed in this article by a discussion of the application of Stokes's law and of results obtained in the laboratory.

Effects of Atmospheric Conditions on Workers.

T. BEDFORD (*The Journal of Industrial Hygiene*, December, 1928) states that among the most potent factors affecting the health and efficiency of the industrial worker must be numbered the atmospheric conditions of his workplace. For many years the importance of these conditions has been recognized. Provisions with regard to temperature, humidity and ventilation were embodied in the factory acts as long ago as 1844. Formerly ventilation was mostly considered as the replacement of vitiated air by fresh, little regard being paid to temperature and humidity. In recent years, however, the importance of these factors has been demonstrated and attention has been drawn to the importance of air movement. Much research on this aspect of ventilation has been carried out of late years and the author summarizes the results of various investigations. The data recorded make it abundantly clear that moderate temperature conditions are required if a maximum of efficiency and of general well-being for the industrial worker is to be insured. Comfort and therefore probably contentment are closely related to atmospheric conditions. Absence on account both of sickness and of accident is influenced to a large extent by the temperature conditions of the workplace and adversely has been shown to be adversely affected by high air temperatures.

British Medical Association News.

SCIENTIFIC.

A MEETING OF THE VICTORIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the Medical Society Hall, East Melbourne, on November 13, 1929, Dr. B. T. ZWAR, the President, in the chair.

Gastric and Duodenal Ulcer.

Dr. HENRY SEARBY read a paper entitled: "The Treatment of Gastric and Duodenal Ulcer" (see page 202).

In opening the discussion, Dr. ALAN NEWTON congratulated Dr. Searby on his lucid exposition of the problem. The paper represented a large amount of work in making such an efficient analysis. Dr. Searby was to be congratulated also on his personal success in the operative treatment of thirty-three patients with perforated ulcer. Dr. Newton agreed with the opinion that it was wrong to perform routine gastro-jejunostomy in these circumstances. This procedure might be considered necessary for two possible reasons, first that the infolding of the visceral walls in the repair of the ulcer made short circuiting necessary. Investigations had proved, however, that this was not so in practice. The second possible reason was that after results were better, but Dr. Searby had shown that this was not true.

Dr. Searby had wisely refused to be drawn into a discussion on the advisability of gastro-jejunostomy as a method of treating non-perforated duodenal ulcer. Medical treatment should be given a thorough trial in this disease before surgical treatment was advised. Dr. Newton suggested that physicians should collect and analyse the results of treatment of chronic ulcers by medical means and present the results at a subsequent meeting. He was not satisfied with the results of gastro-jejunostomy in the treatment of non-obstructing duodenal ulcer. In these cases he preferred other operations, among them the method of gastric exclusion described by Dr. H. B. Devine or Finney's operation.

Dr. KENNETH HADLEY said that while in London he found that almost all leading surgeons did not perform gastro-enterostomy in the treatment of perforating peptic ulcer; 50% of cures were obtained by the infolding method. When operating for chronic gastric ulcer, most surgeons did a partial gastrectomy. Opinions as to the correct treatment of duodenal ulcer varied. He looked upon it as a medical disease, apart from certain complications. When stenosis caused symptoms, gastro-enterostomy should be performed. In cases of hæmorrhage operation should be seriously considered, but only after the patient had recovered from the loss of blood. In these cases gastro-duodenostomy with local treatment of the ulcer was probably the method of choice.

Dr. JOHN KENNEDY congratulated the reader of the paper and expressed agreement with his conclusions and method of treatment. In a discussion at a meeting of the Victorian Branch of the British Medical Association about ten years previously speakers had advocated gastro-enterostomy with radical excision of the ulcer and had quoted mortality rates up to 25%, which were high when compared with Dr. Searby's series.

It had to be remembered that this meeting was laying down a procedure which would be considered by men in practice in all parts of Australia. The condition of these patients was urgent, required immediate interference and the patients should not be transported miles to a hospital, but dealt with by the doctor on the spot. Hence, if the simple procedure was safe, that should be recommended and adopted.

He had operated on a number of perforated gastric and duodenal ulcers in the last ten years and had always used the transverse method of infolding the ulcer which was simple and could be done, no matter how large the ulcer, as easily as doing a simple appendicectomy. He had never seen a stenosis follow and, if such were to occur, a gastro-enterostomy could be done under better conditions. A patient in whom infolding had been performed

and partial gastrectomy done later, had no sign of the infolded ulcer. This had been confirmed by X ray examination of other patients at the hospital.

Dr. C. GORDON SHAW said that the subject under discussion was one of great controversy. In his experience a patient who had been operated on one hour after perforation had occurred, had died an hour after operation, presumably from shock. Possibly from four to six hours after the perforation was the most favourable time for operation. In regard to the difficulties in diagnosis, the absence of a history of previous indigestion and a normal pulse of about seventy beats per minute in the early stages might both be misleading.

Statistics were bewildering and to assign them their true value it was necessary to know the surgeon and the conditions surrounding the patients. In his own practice in the treatment of perforated gastric ulcer Dr. Shaw simply infolded the ulcer, while for duodenal ulcer he infolded and did gastro-duodenostomy.

Some surgeons seemed to aim at the ideal of treating perforated ulcer as they would have treated it if it had not perforated and some statistics of the results of such methods reported from Continental clinics seemed open to doubt. His own method was to infold a duodenal ulcer with very deep sutures and then do a gastro-enterostomy. This procedure was usually followed by no vomiting nor distension and convalescence was usually uneventful. He thought that Dr. Searby's figures for secondary gastro-enterostomy should be considered as part of the primary operation.

For perforated gastric ulcer Dr. Shaw advocated infolding at the immediate operation and partial gastrectomy later.

The gastric contents were infective, but not very infective, and he considered that pelvic drainage was the best method of removing the fluid from the peritoneal cavity.

Dr. Shaw had done gastro-enterostomy in every patient with perforated duodenal ulcer whom he had treated in recent years, without any mortality.

Dr. ROY HUCKELL congratulated Dr. Searby on his results and asked him to what extent he carried the infolding. He stated that in some cases, although the actual ulcer crater was small, the area of infiltration or induration was relatively enormous and the surgeon might hesitate in the search for healthy tissue, to place the sutures too far away from the perforation. This applied, of course, to duodenal ulcer particularly. It was in these patients, he thought, that the question of gastro-jejunostomy arose and, given a patient in satisfactory condition to stand the extra strain, many eminent surgeons still maintained this position. He thought that a way out of the difficulty was by using a really good omental graft to strengthen the suture line rather than to be driven to enfold an abnormally large amount of tissue. After all, he pointed out, the best surgeon was helpless if he saw the patient too late, while the tiro might save the life of a patient seen sufficiently early.

Dr. F. L. DAVIES said that, speaking as an anæsthetist, he agreed with Dr. Searby's attitude of operating as quickly as was possible with efficiency. It was often very difficult to tell whether the patient's condition under the anæsthetic was good enough for the surgeon to proceed and to do a further operation at the same sitting. The process of infolding did not produce serious or permanent stenosis and the risks of gastro-enterostomy, hæmorrhage and leakage were avoided.

Dr. W. OSTERMEYER said that he would have been glad if Dr. Searby had given a fuller description of the signs and symptoms of perforation and he asked if this crisis could be distinguished from other acute lesions in the upper part of the abdomen. Dr. Ostermeyer pointed out that the value of statistics depended chiefly on the accuracy and completeness of the records. It was many years since he had had a patient with perforation and he suggested that this was due to the greater efficiency of medical treatment in this type of condition.

Dr. J. F. WILKINSON said that it was twenty-five years since he began to treat duodenal ulcers with intensive

alkaline or Lenz treatment and he had not seen a single case of perforation in his own practice, including enormous numbers of patients.

When perforation did occur, Dr. Wilkinson stressed the importance of early diagnosis and operation. The modern tendency was to regard duodenal ulcer as a medical disease. When gastro-enterostomy was performed unnecessarily, the anastomosis had frequently to be undone later owing to the unsatisfactory results. In some cases a duodenal ulcer might not heal and might give rise to obstruction.

Dr. KONRAD HILLER agreed with Dr. Wilkinson's remarks and said that his quoted results of alkaline treatment were a further argument against the operation of gastro-enterostomy.

In closing the discussion, Dr. B. T. ZWAR tendered his appreciation and thanks to Dr. Searby and pointed out in answer to Dr. Ostermeyer that diagnosis was not included in the title of the paper. Dr. Zwar recalled a patient at the Melbourne Hospital in whom a right anterior sub-phrenic abscess was present with no cause indicated in the history. X ray examination had suggested a gall bladder lesion, but at operation a perforated duodenal ulcer had been found with adhesions to the gall bladder.

On the question of operative technique in gastric ulcer, Dr. Zwar had come to the conclusion early that resection of the ulcer area was not necessary. In duodenal perforation he had followed the practice outlined by Dr. Shaw, guided by the idea that gastro-enterostomy was desirable for the cure of duodenal ulcer.

As to the time for doing this he was guided, of course, by the condition of the patient and the state of the duodenum after infolding.

Rudgeon and Sargent in their researches on the bacteriology of peritonitis, published in 1906, had shown that gastric contents were more or less sterile and had given the impression that drainage was not essential in early perforation. Such a patient whose abdomen was undrained, had died about a week later from the rupturing of a pelvic collection of pus into the general peritoneal cavity.

It was not possible to be certain at the time of an emergency operation that the fluid was innocuous and Dr. Zwar was convinced that the correct practice was to drain the abdomen.

Dr. Searby, in reply, said that he had purposely avoided detailed reference to diagnosis. Perforated ulcer was a comparatively rare condition and it was common for hospital medical officers to see only three or four such patients during their term of residence. Signs were more important than symptoms, those of peritonism, pain, rigidity and vomiting being the chief. The diagnosis of perforated ulcer should not be doubted because liver dullness was not obliterated. In his experience shock sometimes increased as the hours went on, but he agreed that immediate operation was inadvisable. For the first six hours the pulse rate was usually fairly slow (70 to 90) and the temperature often subnormal, but both might rise within four to six hours. A slow pulse indicated that the shock was not very great.

In his opinion gastro-jejunostomy was not a certain cure for duodenal ulcer. In reply to Dr. Huckell, Dr. Searby said that the first layer of sutures should be beyond the indurated area. Sutures did not last long, closure depended on the proliferation of the endothelium and stenosis did not occur. While recognizing the value of medical treatment, Dr. Searby pointed out that intensive medical treatment was not usually possible with the public hospital out-patient.

NOMINATIONS AND ELECTIONS.

THE undermentioned have been nominated for election as members of the New South Wales Branch of the British Medical Association:

Keatinge, Leila Kathleen, M.B., 1925 (Univ. Sydney), "St. Martin's," Loftus Road, Darling Point.
Paterson, Robert Francis, M.B., Ch.M., 1926 (Univ. Sydney), "Hengrove Hall," 193, Macquarie Street, Sydney.

LISTS OF MEMBERS.

THE lists of members of the several Branches of the British Medical Association in Australia are now in the press and will be available in a short time. Copies can be purchased from the office of THE MEDICAL JOURNAL OF AUSTRALIA at one shilling each.

Medical Societies.

MEDICAL DEFENCE SOCIETY OF QUEENSLAND.

THE annual report of the Council of the Medical Defence Society of Queensland for the year 1929 was presented at the annual meeting. The text is as follows.

ANNUAL REPORT.

Membership.

The society has now a membership of 363. During the year 31 new members were elected and one rejoined. Our losses have been as follows: Ten members left the State, six owe over one year in subscription and one death occurred.

The Council regrets to record the death of Dr. Reginald Freshney, late of Toowoomba.

Office Bearers Elected for 1929.

President: Dr. J. Espie Dods.

Vice-President: Dr. A. B. Carvosso.

Honorary Secretary: Dr. Neville G. Sutton.

Honorary Treasurer: Dr. A. H. Marks.

Auditor: Mr. R. G. Groom (Chartered Accountant).

Councillors: Dr. W. N. Robertson, Dr. Kerr Scott, Dr.

A. G. Anderson, Dr. D. A. Cameron, Dr. Wilton Love,

Dr. R. G. Quinn, Dr. S. F. McDonald.

During the President's absence abroad from March to September, Dr. A. B. Carvosso acted in his stead.

Medico-Legal.

Eight cases were referred to the Council by members of the society, none of which, so far, has been followed by legal action. Settlement was reached in two cases which were dealt with in 1928.

It will be noted that the legal expenses were higher than usual, which was due to costs having been paid on behalf of two members in connexion with (i) a public inquiry and (ii) an accident which was not due to the negligence of a member, but for which he was held responsible and had to settle with his patient. These cases involved an expenditure by the society of £81 5s.

Assets.

The total assets of the society now amount to £2,976 11s. 4d., the balance of the accumulation account for the year being £243 15s. 11d. The amount earned in interest on the various investments was £144 14s. 10d.

J. ESPIE DODS,

President.

Post-Graduate Work.

COURSE IN APPLIED PATHOLOGY IN MELBOURNE.

THE MELBOURNE PERMANENT COMMITTEE FOR POST-GRADUATE WORK announces that a special course of ten lecture-demonstrations on recent advances in applied

pathology will be given at the University of Melbourne by Professor P. MacCallum in April, May and June, 1930. The lecture-demonstrations will be delivered each Tuesday at half past eight o'clock in the evening. The fee for the course is three guineas. Those who intend to participate are requested to send their names to the joint honorary secretaries, Dr. Harold Dew and Dr. W. S. Johnston, 12, Collins Street, Melbourne, as soon as possible and to remit the amount of the fee. Further particulars will be forwarded on application. The following is a summary of the course. The date of the first lecture has been altered.

Tuesday, April 1, 1930.

The blood and hæmopoietic tissues; the nature and relationships of the reacting tissues; the balance of blood cell formation and destruction; differential cellular responses to pathological conditions disturbing the balance; the stability of the erythrocyte; hæmoglobin and iron metabolism; the plasma and blood volume; the peripheral blood as a pathological index.

Tuesday, April 8, 1930.

The blood and hæmopoietic tissues (continued); the interpretation of specific diseases of the blood; secondary and primary anæmias; *polycythæmia rubra*; the leucocythæmias; the spleen and anæmias; tumour relationships.

Tuesday, April 15, 1930.

Inflammatory and degenerative conditions of the arteries; anatomy; changes with age; the incidence, pathogenesis and ætiology of arteriosclerosis; fatty deposits, atheroma and calcification; hyaline and amyloid degeneration; the arteries in diabetes; productive endarteritis; mesarteritis; *thromboangiitis obliterans*; purulent arteritis; *periarteritis nodosa*; syphilitic arteritis; aneurysms.

Tuesday, May 6, 1930.

Bone; origins and relationships of the tissue; conditions of development and maintenance; calcium and phosphorus; endocrines; vitamins; pathological bone formation and resorption; histology, fractures and repair; non-union; acute osteomyelitis and periostitis.

Tuesday, May 13, 1930.

Bone (continued); chronic osteomyelitis and osteitis; tuberculosis; syphilis; rickets and infantile scurvy; the osteomalacias, *osteitis fibrosa* and *osteitis deformans*; age, endocrines and diet; tumours of bone.

Tuesday, May 20, 1930.

Cardiac pathology; (a) the myocardium, the blood supply and arterial disease, atrophy and degeneration, the ætiology and consequences of parenchymatous and interstitial myocarditis, acute and chronic, the conducting system of the heart and pathological lesions; (b) endocarditis, ætiology, pathogenesis and bacteriology.

Tuesday, May 27, 1930.

The liver; structure, blood supply and lymphatic connexions in relation to function and the localization of the effects of circulatory disturbances, intoxications and infections; hæmorrhage, degenerations, focal necrosis and suppuration; regenerative power of liver tissue; acute yellow atrophy and the cirrhoses; tumours and tumour dissemination.

Tuesday, June 10, 1930.

The liver (continued); pathological physiology; experimental pathology; carbohydrate, protein, fat and cholesterol metabolism; detoxication of blood; ascites; bile formation.

Tuesday, June 17, 1930.

Diseases of the mammary gland; structure and functional relationships; lactation and involution; acute and chronic mastitis; precancerous changes; the diagnosis of innocent and malignant tumours; Paget's disease; fat necrosis.

Tuesday, June 24, 1930.

The ovary; development, structure and function and relation to pathology; involution; oophoritis, acute and chronic; cysts and tumours, teratomata, follicular, luteal and blood cysts, endometrioma and carcinoma; parovarian inflammatory and other cysts; connective tissue tumours; secondary growths; the complications and surgical importance of these conditions.

Public Health.

DIPLOMA IN TROPICAL MEDICINE AND DIPLOMA IN PUBLIC HEALTH, UNIVERSITY OF SYDNEY.

THE SCHOOL OF PUBLIC HEALTH AND TROPICAL MEDICINE is in course of completion at the University of Sydney and is expected to open for the first term early in March, lectures beginning on March 17, 1930.

The main object of the school is the teaching of health and, in particular, the training of medical graduates for the Diploma in Public Health (D.P.H.) or the Diploma in Tropical Medicine (D.T.M.).

The course for the Diploma in Public Health which has been given for some years at Sydney University, will be completely reorganized.

It has been found possible to arrange for the student to carry out the full requirements laid down by the General Medical Council by attending every afternoon from Monday to Friday and from late January or early February to November, with examination in December. This should prove of great assistance to many who can give up a half but not a whole day for lecture attendances.

The Diploma in Public Health is becoming an essential qualification for health positions and the new arrangement for afternoon work only should prove attractive.

Of special interest to general practitioners as well as to health personnel is the Diploma in Tropical Medicine.

Already under the auspices of the combined universities of Sydney, Melbourne and Adelaide, the diploma courses of instruction were given in recent years at Townsville. With the transference of the main staff and its equipment from Townsville to Sydney the opportunity has been taken for a thorough revision of the diploma course.

The Diploma in Tropical Medicine may be gained by full time work for one term or about eleven to twelve weeks including examinations. The instruction is clinical as well as laboratory in scope and caters for any medical officer who intends to take up medical work of any kind in northern Queensland and the adjacent islands.

In addition to the main diploma courses facilities can be made available for special study or special investigations.

Intending candidates for either of these diplomas should write without delay to the Director, School of Public Health and Tropical Medicine, University of Sydney. If possible, candidates should attend the school as soon after March 3, 1930, as possible, so as to permit of necessary preliminary arrangements before lectures begin.

Correspondence.

TONSILLECTOMY.

SIR: May I reply to the somewhat heated letter of Dr. Carruthers by, first of all, repeating that the guillotine is applicable to the great majority of cases at any age and as it offers to the skilled technician a simple, short, safe and efficient method of enucleating tonsils, it should commend itself for general use.

There is a minority of tonsils not suitable for the guillotine and these I dissect preferably, but not invariably, under a local anæsthetic with the patient sitting up.

The dissection operation does not present any great difficulties and its results are good, but I claim that the

guillotine (except in non-indicated cases which I have already specified) produces at least equal results in a simpler fashion.

It is obvious that any method of doing an operation will produce bad results and dangerous complications, if the person employing the method has not the requisite skill.

Recently I was called to a private hospital in urgent response to a colleague who was endeavouring to dissect out some adult tonsils. He had removed about half of one tonsil when he could not control the hæmorrhage, nor complete the operation. This does not condemn the dissection method any more than it would condemn the guillotine method had he been using it.

The skilled and experienced guillotine operator will know when the tonsil is completely enucleated without deceiving himself and he will have the second tonsil out before vision is obscured by the mouth and fauces filling up with blood.

I would be profoundly grateful if Dr. Carruthers will tell us where he obtained his statistics.

In conclusion, if Dr. Carruthers will take the trouble to make himself really proficient in the use of a guillotine in adults, I am sure he will find after a fair trial his work (especially his hospital work) greatly simplified and just as efficiently done.

Yours, etc.,

"PRACTITIONER."

January 28, 1930.

SIR: In a recent issue Dr. Hornabrook alleges that to perform dissection of tonsils a pantechnicon of apparatus is required, that a stay of ten to fourteen days in hospital is necessary during which the risks of hæmorrhage are increased, and his reference to torture implies that post-operative pain is increased.

Dr. Warren has replied, but although the letter has told Dr. Hornabrook in no uncertain manner that he is wrong, I doubt if he has enabled him to see why he is wrong.

In comparing the guillotine and dissection operations one must be careful to be fair. The former operation is usually performed in children, whilst the latter is more often performed in adults. In children the tonsils are less frequently imbedded in scar tissue and therefore in them the divided vessels can retract more easily and there is less danger of post-operative hæmorrhage; at the same time less scar tissue means that removal can be performed with less trauma to surrounding tissues and it can be taken as an axiom that, all other factors being equal, there will be less pain (or, shall we say, torture, to satisfy Dr. Hornabrook) with less trauma. Also, the susceptibility to pharyngeal pain varies tremendously in different people, but it is an almost constant finding that children feel this pain less than adults.

In order, therefore, to compare the after effects of the dissection and guillotine operations it is necessary to compare the findings in a practice such as mine where all cases are dissected, with some other practice where cases are treated with the guillotine, but Dr. Hornabrook apparently compares the guillotine operation in children and selected adults with the dissection operation in adults. When a comparison such as I suggest is made, it will be found that children are often only in hospital one night and that the average stay in hospital for all cases is about four days and that the risks of secondary hæmorrhage are less after a properly performed dissection than after a guillotine operation in a similar class of case. I cannot see the necessity of keeping uncomplicated cases in hospital for fourteen days.

"Practitioner" has shown how a bulky anæsthetic apparatus can be avoided, namely, by local anæsthesia; but, as all patients are not psychologically suitable to receive it and equally not all surgeons are psychologically constituted for giving it, general anæsthesia is necessary more or less frequently. In order to give a safe general anæsthetic an apparatus at least considerably more bulky than an open mask and a bottle of ether is required.

As the need for these machines is being more generally appreciated and as their price comes more into line with

their value (as gauged by materials and time taken in their construction), so these machines will be more frequently installed in all operating clinics and the need for portability will cease. Already in Newcastle all the public and the surgical private hospitals are equipped with intratracheal anæsthetic plants and I find that the general practitioners here operate these machines with perfect safety and no more expense to the patient than an open anæsthetic of similar length. In fact, it is a farce to pretend that to give an anæsthetic with the modern one tap ether control machine is even as difficult as an open anæsthetic.

All writers admit that a certain percentage of tonsils are incompletely removed with the guillotine, those that advocate dissection alleging that it is high and *vice versa*. Naturally, it will depend largely on the skill of the operator, but however carefully one foretells, one cannot say with certainty which cases will not be completely removed with the guillotine. The ideal operation is, therefore, dissection, but it is also an ideal that no medical practitioner works for less than £10,000 *per annum*. The numbers of tonsils to be dealt with, the masses of the poor and the overcrowded hospitals on the one hand and the limited numbers of those fully skilled in dissection on the other at present prevent the relegation of the guillotine to the museum. In the future with the possible Utopia in store for us this conclusion may have to be revised, but probably not in our time.

It appears evident to me that whatever the general practitioner does in his practice, when a patient is willing to go to the expense of obtaining treatment by an oto-rhino-laryngologist, he is entitled to the best treatment available and in such a practice I feel very strongly that the guillotine should have no place.

Looked at from another angle, the practice of a general practitioner can survive a proportion of his patients' tonsils recurring, but the practice of an oto-rhino-laryngologist should not, if his patients are discriminating.

Yours, etc.,

A. B. K. WATKINS.

Commercial Bank Chambers,
Bolton Street, Newcastle,
New South Wales.
January 13, 1930.

SIR: Having only experience of the old partial removal of the tonsils to give proper air-way and my little boy requiring removal of his, I was persuaded by an "up-to-date" professional friend to have the boy's tonsils enucleated. This was done by a specialist in the city, but for some months afterwards he complained of dry throat which eventually disappeared with the regrowth of the tonsils, not enough to interfere with breathing, but enough to lubricate the throat. Fortunately for the boy and my peace of mind total enucleation apparently had not been accomplished.

Yours, etc.,

"PARENT."

January 27, 1930.

SIR: I wish to sincerely thank your correspondents for their remarks in your journal: Dr. Charles F. Warren, of December 14, 1929, page 870; Dr. Esmond F. West, of January 25, 1930, page 133; Dr. Douglas G. Carruthers, of January 25, 1930, page 133.

Almost against my will I bade them come to supper—they did sup.

I did not cast my bread—no, Mr. Editor, not pearls—in vain. For which relief much thanks.

I wish my critics no harm, but may at some future date their tonsils be dissected out.

We have enjoyed quite an interesting discussion.

Now, what about diathermy for removal of tonsillar tissue? Diathermy is gradually coming and will continue to come into its own in suitable cases for adults, with advantage to the patient.

In conclusion, may I wish my critics a successful and prosperous new year with an easy conscience.

Yours, etc.,

R. W. HORNABROOK.

120, Collins Street,
January 27, 1930.

THE REDUCTION OF MATERNAL MORTALITY.

SIR: The subject of maternal mortality is of such importance to the medical profession and is arousing so much interest, especially among women's organizations in Australia, that any suggestions to lessen the rate should be welcomed.

The Aberdeen report on this subject is certainly depressing reading, for the doctor is credited with a rate of 6.9% while for midwives the rate is only 2.8%. Allowing for some unfairness in this comparison, it is a fact that the rate 6.9% is far too high.

The suggestion that normal cases should be attended only by the midwife is a serious one for the doctors. For it means that the public would go further and assume that it is not advisable to engage a doctor. Personally, I think the pregnant woman should be under the supervision of the doctor from early pregnancy.

It is impossible to classify beforehand a normal confinement. Such complications as hæmorrhage, eclampsia, cord prolapse, asphyxia of fœtus, tears *et cetera* cannot be foretold. Still the public are insisting that the rate should be lower.

I would make two suggestions, the adoption of which I feel sure would reduce the rate. They are founded on a study of the differences in practice between the midwife and doctor and, however humiliating, an endeavour to reveal the reasons for the better results of the former. First, the doctor should always consider the vagina as septic; second, the use of forceps should almost entirely be discontinued. Of the first, the doctor in examining his patient passes his carefully sterilized gloved finger through the septic vagina and further, seeking the presenting fontanelle through the cervix, carrying a swabbing of vaginal organisms into the uterus, doing just what the bacteriologist does with his platinum loop into a culture tube. The bacteriologist gets his growth in the tube and the doctor gets his growth in the uterus with rise of temperature on or about the fifth day. The midwife, ignorant of the science of presentation and position, examines the vagina only, does not push the finger through the cervix, there are no organisms carried to the uterus and no subsequent rise of temperature.

For years I have limited my examination to the vagina and vaginal vault and never push my finger through the cervix, and although my hospital midwifery cases are limited to about sixty a year, we never get a rise of temperature and have practically discontinued temperature charts. If the cervix must be entered, then the vagina should be sterilized as if for an abdominal section.

Secondly, forceps have been and still are used far too often. The midwife does not use forceps and gets better results. We hear of doctors using forceps in 50% of cases. Such abuse is reprehensible. The doctor who uses forceps for convenience to save his time, is a menace to the mother, his medical brethren and to the unborn baby who cannot defend itself. The doctor who cannot exercise patience, should not do midwifery. Forceps are a frequent cause of sepsis and ill health. If we are to shake off the reproach of this high mortality rate, we must lessen their use. I really do not think they should be used in more than 2% or 3% of cases. I have not required mine for nearly three years.

From a study of these differences in method between doctor and midwife I believe we can learn how to reduce the rate. There could be no greater aim or achievement of the medical profession of Australia for 1930 than a reduction of the maternal mortality rate by 2%.

The Council should use its influence to get the cooperation of doctors doing midwifery to use more patience and

less forceps in 1930; to make 1930 a "no forceps" year. It is humiliating that the midwife should get better results than the doctor. The doctor can lower his rate and both the endeavour and the results will earn the approval of the public.

Yours, etc.,

E. R. ROSEBY, M.B., Ch.M.

Dorriga, New South Wales.
December 12, 1929.

THE ÆTIOLOGY OF RODENT ULCER.

SIR: In the issue of the journal of January 11 there appeared a letter from Dr. Molesworth having regard to an article published by myself a few weeks previously on rodent ulcer due to trauma. Injury as a causative factor in the production of rodent ulcer was only a few months ago definitely stated by my colleague never to play any part at all. From his letter he is apparently modifying his views; a change in the right direction. The view that trauma is a causative factor in rodent ulcer is not a new one, for a perusal of our leading dermatological text books will soon demonstrate this. I quote first from the well known text books on dermatology by Radcliffe Crocker in England and Stelwagon in America. The former states: "A certain number date from a local injury." The latter, like many American authors, incorporates rodent ulcer under the general grouping of epithelioma of the skin and under "Ætiology" states: "The disease has often been noted to start at the site of a scratch, cut, or other accidental traumatism." On taking up one of the most recent and best known English text books, that of Macleod, under the "Ætiology of Rodent Ulcer" I find the following passage: "In most instances no cause can be suggested for it and the lesion is usually discovered by accident. On the other hand cases are on record where it has followed some slight injury, such as a prick or sting." A similar opinion by Dubreuilh, a French authority, will be observed later in an extract of an article by myself. To doubt the authenticity of that which is evident, as recorded in the photographs accompanying my article, makes me come to the conclusion that there is none so blind as those who do not wish to see. These two cases were shown at a meeting of the New South Wales Branch of the British Medical Association held at the Sydney Hospital, and Case I, referred to by Dr. Molesworth at a joint meeting of the New South Wales and Victorian Branches of the British Association of Dermatology at which there were about thirty dermatologists present, yet his was the only dissentient voice that I heard and when discussion of the cases was called, no one voiced a different opinion or questioned the authenticity of its origin. The full photograph as sent to the journal will show that there is no evidence of chronic sunburn in this patient nor did even the third degree by my colleague extract from the patient an admission that the injury had occurred on a scaly spot or keratosis.

On the question of rodent ulcer due to sunlight, I do not propose to discuss this at length, but to say that I was one of the pioneers of this opinion, as recorded in my book on "The Influence of Sunlight in the Production of Cancer of the Skin" (H. K. Lewis) and by a later article, "Observations on the Origin, Causation and Treatment of Rodent Ulcer" (THE MEDICAL JOURNAL OF AUSTRALIA, January 27, 1923), the former published ten years and the latter four years before Dr. Molesworth thought of publishing a similar expression of opinion on this subject. From my latter article I would like to extract a portion dealing with the causation of rodent ulcer which represents my views today and will also act as a reply to portion of the letter referred to.

Dubreuilh states that rodent ulcer begins ordinarily on a healthy or normal skin, . . . in quite late cases they are consecutive to a senile keratoma, to a nevus, or can be provoked by traumatism. He records statistics to show that exposure does not play the

same part in producing a rodent ulcer as it does in producing keratomata or epitheliomata, for in a series of patients with keratomata and epitheliomata collected by him 62.5% had an outdoor occupation, 37.5% had an indoor occupation, whilst of one hundred and five patients with rodent ulcer thirty-five pursued an open air vocation and seventy worked in the shade. He is of the opinion that dwellers in the city and country are equally prone to it and the proportion of two dwellers in the shade to one worker in the sun is the usual proportion of patients attending his clinic. I am in accord with Dubreuilh that a growth histologically indistinguishable from rodent ulcer may be consecutive to a senile keratoma or what might be more aptly called a *Keratosis solare* (Fig. 3), that rodent ulcer may be consecutive to a nevus (mole) or can be provoked by traumatism, a history not infrequently given by patients. But I am of the opinion that in Australia they are of more common occurrence in those working outdoor, especially in the country, and that the actinic rays of the sun may directly or indirectly produce them. (Undoubtedly, the actinic rays of the sun are more prone to produce keratoses and epitheliomata than rodent ulcer.) However, there is a large class of rodent ulcer that appears spontaneously, to which attention must also be directed. Included in this category as a typical example are those somewhat rare cases of multiple rodent ulcer which occur in young adults between the ages of twenty and thirty and are characterized by numerous (thirty to forty) typical rodent ulcers widely disseminated over the face. Photographs illustrating this type are shown in my book under multiple rodent ulcer. It is a significant fact that, although rodent ulcers may occur on practically any portion of the body, they are usually localized on the face and more especially to the central horizontal third. The sites of predilection are the eyelids, especially the inner and outer canthi and the nasofacial grooves. Moreover, in patients exposed to strong sunlight one or more rodent ulcers may be seen on the face, whilst on the neck and dorsum of the hands of the same patient there may be present innumerable keratoses, but rodent ulcer occurs seldom on the dorsum of the hands and never or very rarely indeed on the back of the neck. To what can this special area of localization be attributed? Can it be attributed to the fact that on the hands and neck the hair follicles are formed and a function is assigned to them, whilst there are present on certain areas of the face hair follicles or pilo-sebaceous apparatus of a more embryonic and more immature type? Progressing further, we arrive at a theory which has been propounded enthusiastically by various dermatologists and which although hypothetical, would appear to account for a large number of those cases of rodent ulcer occurring spontaneously, namely, the *nevusoid* theory. At various periods of life new growths appear on the cutaneous surface which are doubtless associated with some congenital defect. These so-called *nevusoid* growths manifest themselves at certain periods of life, for example, at birth (moles), at puberty or a little later (*adenoma sebaceum*, *epithelioma adenoides cysticum* of Brooke) *et cetera*. According to the theory of Cohnheim, they are regarded as of embryonic development. The face is the site of predilection of these *nevusoid* growths and in order to understand better the reason for this localization it is necessary to recall to mind the human development *in utero* and to review the important part played by the fusion of the various parts in the face region at this period. It may be possible for some congenital defect to take place during fusion at this developmental period which may assert itself at birth or lie dormant and only manifest itself at a later period. This congenital defect might consist of an epidermal cell rest, capable when subjected to some special stimuli of proliferation or it might consist of a rudimentary or embryonic type of pilo-sebaceous apparatus which, being unstable, might likewise when subjected to certain stimuli, attempt to proliferate. Such stimuli might be represented by general metabolic stimuli as seen at puberty or physical

stimuli produced by irritation *et cetera*. Age is a potent factor in rodent ulcer, producing senile or retrograde changes in the corium, so that the normal balance between epidermis and corium is altered and the check on the development of immature *nevusoid* cells or immature pilo-sebaceous follicles is removed. Age is not the sole factor in producing these senile or retrograde changes, for the actinic rays of the sun can produce a precocious senility of the skin. Summarizing the *nevusoid* theory, it may be said that in the embryo the basal cell layer can aptly be regarded as a plastic layer, capable of developing not only the remaining layers of the epidermis, but also capable of being moulded or modelled into the various adnexa of the skin. But in some cases there remains in the basal cell layer certain foci of cells (cell rests) which, owing either to an alteration in their environment or to some stimuli at a later period of their development, cause them to make a futile attempt at the development of the appendages of the skin resulting merely in cellular proliferation.

As regards the incidence of rodent ulcer due to trauma, I stated in my opening remarks: "Of the causative factors in the production of basal cell epithelioma trauma plays a part which is not inconspicuous," meaning that it is one of the causative factors to be considered in the production of rodent ulcer, but not implying that it is a frequent or important cause as stated in Dr. Molesworth's letter.

Yours, etc.,

NORMAN PAUL.

"Harley," 143, Macquarie Street, Sydney.

January 15, 1930.

THE REMUNERATION OF RESIDENT MEDICAL OFFICERS.

SIR: In your leading article on January 4, 1930, you pointed out that difficulty is at the present time being experienced in finding young graduates to fill the positions of resident medical officers at public hospitals and other medical institutions and you set out the principle that it is a good thing for these institutions to be able to select their resident staffs from the most distinguished graduates of the year. "More undergraduates are needed," you said. Now, sir, I should be grateful if you would allow me space in your columns to draw the attention of the profession at large to the very unfair treatment by the largest Sydney metropolitan public hospitals of their resident medical officers, which aggravates their difficulty in securing resident staffs, and leads to shorthandedness and overworking of the staffs engaged, besides inevitably deterring many from embarking upon medical careers.

The salary of a junior resident medical officer at the Royal Prince Alfred Hospital is £1 8s. 1d. per week! At the Sydney Hospital it is only £1 13s. 9d.

The young graduate has just finished serving the longest of all apprenticeships and has throughout been wholly dependent on his family; yet, when he is at last qualified and able to earn a modest livelihood, he usually feels that he would be happier and better equipped to confront the problems and cope with the crises of medical practice if he had behind him the practical experience to be gained from working for a year as resident medical officer to a general hospital in association with the skilled and learned honorary medical officers to such institutions. In particular young graduates are anxious for association with the "honoraries" to the Royal Prince Alfred Hospital or the Sydney Hospital. The offering and paying of salaries so small as those mentioned above is undoubtedly exploitation by the hospital authorities of the young graduate's keenness to improve his craftsmanship and it certainly might be implied that they make use of the charitable attendance of the honorary medical officers to impose upon the latter's junior professional brethren.

There can be no question that it is inimical to the interests of the medical profession for its junior members to be employed for remuneration of less than half the

figure found to be the minimum living wage for unmarried unskilled rural labourers receiving free board and lodging; there can be no question that the hospital salaries quoted above should be double at least. I venture to suggest that the New South Wales Branch of the British Medical Association should as soon as possible earnestly consider and act as it thinks fit in the matter of the remuneration of resident medical officers.

Yours, etc.,

DOUGLAS ANDERSON.

"Afton."

Greenwich Point,
New South Wales,
January 20, 1930.

INVALID PENSION.

SIR: The letter of "Alas Australia" is opportune. It calls attention to a serious factor in the economic life of Australia.

The official statistics of the burden borne by the Government of Australia in the matter of payment for public charity *et cetera* disclose an alarming state of affairs.

In 1928:

Old age and invalid pensions cost	£8,252,387
Maternity cost	680,855
Administration cost	112,322
Orphanages	
Insane	
Lepers	
Neglected children	
Benevolent asylums	
Hospitals	
Total Government expenditure on	
charity	£16,820,636

The number benefiting by this huge expenditure was 1,182,755. In addition, there are 252,609 war pensions whose cost is £7,498,789. Excluding war pensions, we find that one in every six of our population is in receipt of some form of Government relief and that £10,000 per working hour are being disbursed by public authority.

Besides this, there is the enormous and incalculable expenditure of private charity.

Is not this a disgraceful state of affairs for a people scarce one hundred years old?

It is hardly to be supposed that a medical journal is the place to discuss the economic causes of this sad business that is sapping not only the wealth of the country, but, worse still, the morale of our citizens. But a few ways in which the medical profession can help to mitigate this burden may be suggested.

I have acted as Commonwealth Medical Referee for over ten years and have made a rough classification of all cases, numbering about 10,000, that I have examined. A far greater number of these cases come under the category of neuropathic than any other single cause. By this term I mean persons with many subjective symptoms, but who show no definite sign of organic disease. One cannot, of course, absolutely exclude chronic low-grade infections and slight degenerative changes. A very large proportion of these cases have been subjected to surgical operations and these nearly all declare that their condition has become worse subsequent to these surgical interferences.

There is here a very definite sphere for improvement in treatment by our surgeons. I would suggest that a more wise discrimination be exercised before cases of this type be subjected to operation and, in fact, would go so far as to say that it would be to the public benefit that this type, of which there appears to be an increasing number, be not subjected to surgery unless to save life.

The next suggestion I would make is that patients be not given certificates of incapacity by medical men unless the latter are quite convinced that the patient is totally and permanently incapacitated.

There are numerous cases of such conditions as epilepsy, rheumatism and fibrosis of lungs which are capable of some employment, but who are given certificates by medical men and told that they should not work.

It is very difficult for a medical referee to exclude these cases from pension benefit once they have been pronounced unfit to work by the medical man whom they have consulted and in whom they naturally have more confidence than in the Government referee. The use of the X ray for lung examination is one of many cooperating causes that leads to the idea of inability to work—persons with vague ill health and perhaps slight pulmonary signs are examined by X ray and upon some fibrous change being noted they are told they have "T.B." The psychological effect of this pronouncement is too well known to need elaboration.

The above suggestions are offered as a basis for discussion and criticism, not in a spirit of antagonism to the members of our profession who are dealing daily with the baffling problems of temperament, character and disposition and the many other factors that are concerned with ill health.

The problem is a serious one from every aspect, but the financial burden entailed is becoming so enormous that it is the duty of every medical man to recognize its importance and endeavour to give his very best to lessen the national burden, to raise the morale of the citizens and thus help to increase our national efficiency.

Yours, etc.,

PAUL G. DANE.

110, Collins Street, Melbourne.
January 15, 1930.

TRANSMISSION OF MALARIAL BLOOD BY AEROPLANE.

SIR: An interesting illustration of the use of the aeroplane in medicine occurred in October of last year.

The Medical Superintendent of Goodna Mental Hospital, Brisbane, made arrangements for a supply of a particular type of malaria which has proved very useful at Callan Park Mental Hospital in the treatment of general paralysis during the past three years, to be sent to Goodna for a similar purpose.

To this end four cubic centimetres of malarial blood were taken from a patient at Callan Park at 9 a.m. and placed in two two cubic centimetre tubes which were wrapped in cotton wool and placed in an ordinary "Thermos" flask filled with cracked ice and salt.

This was handed to Captain Brain in the *Atalanta* at Mascot at 10 a.m. Eagle Farm, Brisbane, was reached after a non-stop flight at 3.30 p.m. and the blood injected into two Goodna patients later that afternoon.

The inoculation was successful, the incubation period being twenty-one days. Note: The usual period is from twelve to fourteen days.

Yours, etc.,

CLIFFORD HENRY, M.B., Ch.M., D.P.

Mental Hospital,
Callan Park, New South Wales.
(Undated.)

NASAL DISCHARGE AND CHEST COMPLICATIONS.

SIR: Among the original articles in THE MEDICAL JOURNAL OF AUSTRALIA for January 4, 1930, is one on persistent nasal discharge and chest complications in children. I was disappointed that no reference was made to the work of previous writers who have also written on this subject in this journal and formed similar conclusions.

Dr. Graham Brown, of Brisbane, I believe, was the first to draw attention to the association of these two conditions and articles by him have appeared as follows: (i) "Recent Advances in the Ear, Nose and Throat Specialty," THE MEDICAL JOURNAL OF AUSTRALIA, May 28, 1921, (ii) "Bronchiectasis in Children," THE MEDICAL JOURNAL OF

AUSTRALIA, October 8, 1927, (iii) "Bronchiectasis in Children: The 'Pseudo-Robust' Appearance in Cases Associated with Nasal Accessory Sinus Suppuration," *Proceedings of the Royal Society of Medicine*, May 4, 1928, (iv) the same, *The Journal of Laryngology and Otology*, September, 1928.

Finally this subject was widely discussed in the opening paper at the combined meeting on chronic pulmonary infections in relation to the upper respiratory tract at the recent medical congress in Sydney.

Several articles on this matter have also appeared in recent English and American journals.

As is pointed out in the article referred to, early recognition is the all important factor, for in the early stages the removal of the foci of infection in the upper respiratory tracts provides excellent results. Although in the later stages such treatment gives less hopeful results, nevertheless there is little prospect of any permanent relief unless it be undertaken.

Yours, etc.,

P. A. EARNshaw.

Ballow Chambers,
Wickham Terrace, Brisbane.
January 22, 1930.

ANÆSTHESIA FOR CÆSAREAN SECTION.

SIR: In your issue of January 4 is a report by Dr. Swift of Cæsarean section under gas-oxygen anæsthesia for a broken-down heart.

The number of men competent to give this anæsthesia or who have the apparatus, is small, especially away from the cities.

In two Cæsarean sections for this condition I have found 0.5% "Novocain" injected into the thinned-out abdominal wall an efficient anæsthesia, permitting an uneventful delivery of the child (without injection of the uterus) and also sterilization and removal of the appendix.

This note is forwarded not to decry the use of gas-oxygen anæsthesia, but to keep in view the use of local anæsthesia, especially where the other apparatus is not procurable.

Yours, etc.,

E. A. JOSKE, M.B., B.S. (Melbourne).

Verco Building,
North Terrace,
Adelaide.
January 27, 1930.

A DISCLAIMER.

SIR: We the undersigned disclaim any association whatsoever with the publication of an article in the *Brisbane Daily Mail* on January 25, 1930, under the title "Clinic for Brisbane."

This disclaimer has been endorsed by the Council of the Queensland Branch of the British Medical Association.

Yours, etc.,

JOHN BOSTOCK.
L. J. JARVIS NYE.
JOHN POWER.

Ballow Chambers,
Wickham Terrace,
Brisbane.
February 6, 1930.

MISSIONARY WORK IN TANGANYIKA.

THE following members of the Victorian Branch of the British Medical Association have issued a circular letter concerning the medical missionary work of Dr. Murray Buntine in Tanganyika: Dr. A. V. M. Anderson, Dr. J. W. Dunbar Hooper, Dr. Francis E. Langley, Dr. J. F. Mackeddie, Dr. H. Lawrence Stokes, Dr. Walter Summons, Dr. Douglas J. Thomas, Dr. Harold A. Woodruff.

We feel that you are interested in Dr. Murray Buntine, of Central Tanganyika, and desire to give you some information regarding him and his work.

Dr. Buntine is one of our Melbourne graduates who, after qualifying, became resident at the Alfred Hospital, and later settled in practice at Murrumbidgee. He is the son of Mr. Buntine, of the Caulfield Grammar School. Last year Dr. Buntine linked himself up with Bishop Chambers in Central Tanganyika, and after obtaining the Diploma of Tropical Medicine and Hygiene at the School of Tropical Medicine, London, has now commenced work at Kilimatinde. Here he is building a hospital, and in addition to general work there is to be a beginning made with the treatment of lepers. He is assisted by two trainees of the Alfred Hospital, Melbourne, and by other Australians.

Tanganyika Territory was formerly German East Africa. It has now been handed to Great Britain under a mandate from the League of Nations. The Government in the medical work and administration has sought the cooperation of the missionaries and Australia was asked and has accepted responsibility for the Diocese of Central Tanganyika. This responsibility belongs to Australia solely and is not shared by others.

Dr. Buntine has a great job to do and he will be glad of our help. For that reason some of his friends send you this letter urging his claims and ask for your special individual monetary assistance at this time, so that he can be well set up in the matter of instruments and equipment. He himself felt called upon to give up his practice in Melbourne, and his wife is at present on the water travelling to join him at Kilimatinde.

Because the development of this new country is largely Australia's responsibility, and especially because Dr. Murray Buntine was a member of the Victorian Branch of the British Medical Association, medical men here will be peculiarly interested. Doubtless many will desire to send cheques or in some way to assist in his hospital. Any of the signatories of this letter will be glad to receive and acknowledge cheques or they may be sent to the Treasurer, Church Missionary Society, Cathedral Buildings, Swanston Street, Melbourne, C.1.

REGISTRATION OF AUSTRALIAN MEDICAL DEGREES IN ENGLAND.

OUR attention has been directed to a condition of registration of medical practitioners on the colonial list of the Medical Register of the United Kingdom that appears to be little known. Clause 11 in Part II of the *Medical Act, 1886*, provides that the holder of a recognized medical diploma granted to him in a British possession, who produces evidence that he is entitled to practise medicine, surgery and midwifery in that British possession, is entitled to be registered as a colonial practitioner in the Medical Register. The degrees granted in the British possessions and recognized by the General Medical Council are set out in a schedule, together with the words: "No degree or qualification can be recognized unless it is registered in the State or Province of origin." Recently a graduate in medicine of the University of Melbourne, practising in New South Wales and registered in the latter State alone, was refused registration by the General Medical Council while in England.

MOTOR CARS IN ENGLAND.

At the request of the Council of the Victorian Branch of the British Medical Association we are reproducing a circular letter signed by Mr. L. Ferris Scott, the Honorary Secretary of the Medical Insurance Agency, Limited, which may be of interest to medical practitioners visiting England.

The enjoyment of leave at home is greatly enhanced by the possession, even if temporary, of a car.

As a result of many inquiries received, the Agency added to the services it offers freely to the Medical Profession and appointed Messrs. Mann Egerton & Co., Ltd., of London, Norwich, Ipswich and Bury St. Edmunds, to act as Consulting Motor Engineers to the Agency and to provide gratis expert advice on the purchase, upkeep, use and sale of motor cars.

The enclosed pamphlet has been prepared in order to give people abroad full information as to every point in the procedure of purchasing, registering, insuring, etc. etc., for use on leave.

We especially recommend all Medical Men in London or visiting England to make the fullest use of the service thus offered.

We understand that the circular letter and pamphlet have been sent to medical practitioners throughout the Commonwealth.

Books Received.

ANNALS OF THE PICKETT-THOMSON RESEARCH LABORATORY: Volume V; 1929. London: Baillière, Tindall and Cox. Demy 4to., pp. 387, with illustrations. Price: 42s. net.

MOTHER ENGLAND: A CONTEMPORARY HISTORY. Edited by Marie C. Stopes, D.Sc. (London), Ph.D., F.L.S.; 1929. London: John Bale, Sons and Danielsson, Limited. Demy 8vo., pp. 212. Price: 10s. 6d. net.

MEDICAL INSURANCE EXAMINATION: MODERN METHODS AND RATING OF LIVES, by J. Paterson MacLaren; Second Edition; 1929. London: Baillière, Tindall and Cox. Demy 8vo., pp. 661. Price: 30s. net.

Diary for the Month.

- FEB. 18.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
 FEB. 25.—New South Wales Branch, B.M.A.: Medical Politics Committee.
 FEB. 25.—Queensland Branch, B.M.A.: Obstetrical Section.
 FEB. 26.—Victorian Branch, B.M.A.: Council.
 FEB. 27.—South Australian Branch, B.M.A.: Branch.
 FEB. 28.—Queensland Branch, B.M.A.: Council.

Medical Appointments.

UNDER the provisions of the *Medical Act*, 1894, Dr. H. T. Kelsall (B.M.A.), Dr. T. L. Anderson (B.M.A.), Dr. D. D. Paton (B.M.A.), Dr. R. C. E. Atkinson (B.M.A.), Dr. D. P. Clement (B.M.A.), Dr. A. H. Gibson (B.M.A.) and Dr. F. A. Hadley (B.M.A.) have been nominated to the Medical Board of Western Australia.

Dr. Hugh Ward Anderson (B.M.A.) has been appointed Government Medical Officer at Herberton, Queensland.

Dr. Charles Ernest Cameron Wilson (B.M.A.) has been appointed Officer of Health under the *Health Acts*, 1898-1925 of South Australia.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser," page xvi.

CAIRNS HOSPITALS BOARD, QUEENSLAND: Resident Medical Officer.

MARYBOROUGH HOSPITALS BOARD, QUEENSLAND: Junior Resident Medical Officer.

THE BENEVOLENT SOCIETY OF NEW SOUTH WALES, ROYAL HOSPITAL FOR WOMEN, PADDINGTON, SYDNEY: Honorary Surgeon.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 21, Elizabeth Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company, Limited. Phoenix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Members accepting appointments as medical officers of country hospitals in Queensland are advised to submit a copy of their agreement to the Council before signing. Brisbane United Friendly Society Institute. Mount Isa Hospital.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	All Lodge Appointments in South Australia. All Contract Practice Appointments in South Australia. Booleroo Centre Medical Club.
WESTERN AUSTRALIAN: Honorary Secretary, 65, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (Wellington Division): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Medical practitioners are requested not to apply for appointments to positions at the Hobart General Hospital, Tasmania, without first having communicated with the Editor of THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to "The Editor," THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2.)

SUBSCRIPTION RATES.—Medical students and others not receiving THE MEDICAL JOURNAL OF AUSTRALIA in virtue of membership of the Branches of the British Medical Association in the Commonwealth can become subscribers to the journal by applying to the Manager or through the usual agents and book-sellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rates are £2 for Australia and £2 5s. abroad *per annum* payable in advance.